IBM Mobile Systems

S05L-1270-01

Hardware Maintenance Manual
Volume 4: ThinkPad Computers

September 1997

We Want Your Comments!
(Please see page 697)

This Manual Supports:

ThinkPad 380	(2635)
ThinkPad 385	(2635)
ThinkPad 560	(2640)
ThinkPad 560E	(2640)
ThinkPad 760C/CD	(9546)
ThinkPad 760E/ED	(9546)
ThinkPad 760L/LD	(9546)
ThinkPad 760EL/ELD	(9547)
ThinkPad 760XL	(9546)
ThinkPad 760XD	(9547)
ThinkPad 765D	(9546)
ThinkPad 765L	(9547)
ThinkPad 770	(9548, 9549)
SelectaDock III	(3547)

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Note

Before using this information and the product it supports, be sure to read the general information under “Notices” on page 702.

Second Edition (September 1997)

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About This Manual

This manual contains service and reference information for IBM ThinkPad 380, 385, 560, 760, 765, 770, and SelectaDock III products. Use this manual along with the advanced diagnostic tests to troubleshoot problems effectively.

The manual is divided into sections as follows:

- The Introduction section provides general information, guidelines, and safety information required to service computers.
- The product-specific sections include service, reference, and product-specific parts information.
- The Common Devices Checkout section provides procedures for testing the devices that are commonly attached to ThinkPad computers.
- The Miscellaneous Information section contains information about acronyms, abbreviations, terms, and a telephone number listing.

Important

This manual is intended for trained servicers who are familiar with ThinkPad products. Use this manual along with the advanced diagnostic tests to troubleshoot problems effectively.

Before servicing an IBM mobile product, be sure to review the safety information under “Safety Notices (Multi-lingual Translations)” on page 8 and “Safety Information” on page 15.

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Related Publications

The following mobile product publications are available through IBM or your IBM Authorized Dealer.

Publication	Part, Form Number
Mobile Systems HMM Volume 1: Laptop, Notebook, Portable, and ThinkPad Computers (Models L40, CL57, N45, N51, P70, P75, ThinkPad 300, 350, 500, 510, 710T, Expansion Unit, Dock I, Dock II)	30H2356, S82G-1501-01
Mobile Systems HMM Volume 2: ThinkPad Computers (Model 340, 355, 360, 370, 700, 701, 720, 750, 755)	30H2357, S82G-1502-03
Mobile Systems HMM Volume 3: ThinkPad Computers (Model 365, 380, 385, 560, 760, SelecataDock	84H8099, S82G-1503-05
ThinkPad 700 (9552) HMS	42G2016, S42G-2016
ThinkPad 700 (9552) HMR	42G2015, S42G-2015
ThinkPad 700C (9552) HMS	42G2022, S42G-2022
ThinkPad 700C (9552) HMR	42G2021, S42G-2021
ThinkPad 720/720C (9552) HMS	61G1193, S61G-1193
ThinkPad 720/720C (9552) HMR	61G1187, S61G-1187
ThinkPad 730T (2524) HMM	82G5497, S82G-5497
ThinkPad Exp. Crtg. (3550) HMS	42G2338, S42G-2338
ThinkPad Exp. Crtg. (3550) HMR	42G2339, S42G-2339
PS/2 FaxConcentrator HMS	15F2262, S15F-2262
PS/2 FaxConcentrator HMR	84F8541, S84F-8541
PS/2 Comm. Cartridge I HMS	10G5993, S10G-5993
PS/2 Comm. Cartridge I HMR	10G5992, S10G-5992
IBM High Speed Internal, PCMCIA Data/Fax Modems	61G1556, S61G-1556

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Related Diskettes

The following diskettes are available through IBM or your IBM Authorized Dealer.

Diskette	Part, Form Number
ThinkPad 300 (2615) Advanced Diagnostics Diskette	33G9361, S33G-9361
ThinkPad 350, 350C, 425, 425C (2618) Advanced Diagnostics Diskette	A211000, GA21-1000
ThinkPad 365 (2625) Advanced Diagnostics Diskette	76H7578, S30H-2498
ThinkPad 380, 385 (2635) Maintenance Diskette	06J0333, S06J-0333
ThinkPad 500 (2603) Advanced Diagnostics Diskette	71G3702, S71G-3702
ThinkPad 510 (2604) Advanced Diagnostics Diskette	83G8095, S83G-8095
ThinkPad 700 (9552) Reference Diskette	42G2017, S42G-2017
ThinkPad 700C (9552) Reference Diskette	42G2023, S42G-2023
ThinkPad 720/720C (9552) Reference Diskette	61G1194, S61G-1194
ThinkPad Hardware Maintenance Diskette (for all Models 355, 360, 560, 750, 755, 760)	78H5384, S78H-5384
ThinkPad Dock I (3545)	71G4140, S71G-4140
Docking Station (3550)	42G2428, S42G-2428
Data/Fax Modem	61G1556, S61G-1556
FaxConcentrator/A	84F8540, S84F-8540

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Mobile Computer Descriptions

Models N51, CL57, and P70/75 and Thinkpads 700x and 720x are Micro Channel systems. All others are AT/ISA bus systems.

Model	Type	Processor	Memory	Hrd Dsk
Model L40SX	8543-044	386SX-20	2M/18M	60M
Model N45 SL	2614-065	386SL-25	2M/8M	80M
	2614-067	386SL-25	2M/8M	120M
Model N51 SLC	8551-025	386SLC-16	2M/10M	80M
Model N51 SX	8551-033	386SX-16	2M/10M	40M
Model CL57 SX	8554-045	386SX-20	2M/16M	80M
Model P70 386	8573-031	80386-16	2M/8M	30M
	8573-061	80386-20	2M/8M	60M
	8573-121	80386-20	2M/8M	120M
Model P75 486	8573-161	80486-33	8M/16M	160M
	8573-401	80486-33	8M/16M	400M
ThinkPad 300	2615-065	386SL-25	4M/12M	80M
	2615-067	386SL-25	4M/12M	120M
ThinkPad 340	2610	486SLC2-50/25	4M/12M	125M
ThinkPad 340CSE	2610	486SLC2-50/25	4M/12M	200M
ThinkPad 340CSE	2610	486SLC2-66/33	4M/12M	360M
ThinkPad 345	2610	486DX4-75	4M/20M	360M
ThinkPad 345CS	2610	DX4-75	4M/20M	540M
ThinkPad 350	2618-AOE	486SL-25	4M/20M	85M
	2618-JOA	486SL-25	4M/20M	125M
	2618-LOA	486SL-25	4M/20M	250M
ThinkPad 350C	2618-NOA	486SL-25	4M/20M	125M
	2618-POA	486SL-25	4M/20M	250M
ThinkPad 355	2619	486SX-33	4M/16M	125M
ThinkPad 355C	2619	486SX-33	4M/16M	125M
	2619	486SX-33	4M/16M	250M
ThinkPad 355Cs	2619	486SX-33	2M/16M	170M
	2619	486SX-33	2M/16M	250M
ThinkPad 360	2620	486SX-33	4M/16M	170M
	2620	486SX-33	4M/16M	340M
ThinkPad 360C	2620	486SX-33	4M/16M	170M
	2620	486SX-33	4M/16M	340M
ThinkPad 360Cs	2620	486SX-33	4M/16M	170M
	2620	486SX-33	4M/16M	340M
ThinkPad 360Ce	2620	486DX2-50/25	4M/16M	170M
	2620	486DX2-50/25	4M/16M	340M
	2620	486DX2-50/25	4M/16M	540M
ThinkPad 360Cse	2620	486DX2-50/25	4M/16M	170M
	2620	486DX2-50/25	4M/16M	340M
	2620	486DX2-50/25	4M/16M	540M
ThinkPad 360P	2620	486SX-33	4M/16M	170M
	2620	486SX-33	4M/16M	340M
ThinkPad 365C	2625-205	486DX4-75	8M/24M	340M
	2625-x05	486DX4-75	8M/24M	540M
ThinkPad 365E	2625	5x86-100/33	8M/24M	540M
ThinkPad 365ED	2625	5x86-100/33	8M/24M	540M
ThinkPad 365X/XD	2625	Pentium-100	8M/24M	540M
	2625	Pentium-100	8M/24M	810M
	2625	Pentium-100	8M/24M	1.0G
ThinkPad 365X/XD	2625	Pentium-120	8M/24M	540M
	2625	Pentium-120	8M/24M	810M
	2625	Pentium-120	8M/24M	1.0G
ThinkPad 365X/XD	2625	Pentium-133	8M/40M	810M
	2625	Pentium-133	8M/40M	1.0G
	2625	Pentium-133	8M/40M	1.3G
ThinkPad 370C	9545	486DX4-75/25	4M/32M	340M
	9545	486DX4-75/25	4M/32M	540M
	9545	486DX4-75/33	4M/32M	810M

C	Color	**T**	Tablet
M	Megabyte	**TPF**	ThinkPad File
P	Pen		

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Model	Type	Processor	Memory	Hrd Dsk
ThinkPad 380	2635	Pentium-150	16M/48M	1.08G
	2635	Pentium-150	16M/48M	1.35G
	2635	Pentium-150	16M/48M	2.10G
	2635	Pentium MMX-150	16M/48M	2.10G
	2635	Pentium MMX-166	16M/48M	2.10G
ThinkPad 385	2635	Pentium-150	16M/48M	1.08G
	2635	Pentium-150	16M/48M	1.35G
	2635	Pentium-150	16M/48M	2.10G
	2635	Pentium MMX-166	16M/48M	2.10G
ThinkPad 500	2603-081	486SLC2-50/25	4M/12M	80M
	2603-171	486SLC2-50/25	4M/12M	170M
ThinkPad 560	2630	Pentium-100	8M/40M	540M
	2630	Pentium-100	8M/40M	810M
	2630	Pentium-100	8M/40M	1.0G
ThinkPad 560	2630	Pentium-120	8M/40M	540M
	2630	Pentium-120	8M/40M	810M
	2630	Pentium-120	8M/40M	1.0G
ThinkPad 560	2640	Pentium-130	8M/40M	540M
	2640	Pentium-130	8M/40M	810M
	2640	Pentium-130	8M/40M	1.0G
ThinkPad 560E	2640	Pentium MMX-150	8M/80M	2.1G
	2640	Pentium MMX-166	8M/80M	2.1G
	2640	Pentium-130	8M/40M	1.0G
ThinkPad 700	9552-300	486SLC-25	4M/16M	80M
	9552-301	486SLC-25	4M/16M	120M
ThinkPad 700C	9552-30B	486SLC-25	4M/16M	120M
ThinkPad 701C	2630	486DX2-25/50	4M/32M	360MB
	2630	486DX2-25/50	4M/32M	540MB
	2630	486DX4-25/75	8M/32M	360MB
	2630	486DX4-25/75	8M/32M	540MB
ThinkPad 701Cs	2630	486DX2-25/50	4M/32M	360MB
	2630	486DX2-25/50	4M/32M	540MB
	2630	486DX4-25/75	8M/32M	360MB
	2630	486DX4-25/75	8M/32M	540MB
ThinkPad 710T	2523-09Y	486SLC2-25	4M/12M	TPF
	2523-302	486SLC2-25	4M/12M	60M
	2523-303	486SLC2-25	4M/12M	60M
ThinkPad 720	9552-307	486SLC-25/50	4M/16M	120M
	9552-308	486SLC-25/50	4M/16M	160M
ThinkPad 720C	9552-30J	486SLC-25/50	4M/16M	160M
ThinkPad 730T	2524	486SLC2-25	4M/12M	0M
	2524	486SLC2-25	4M/12M	60M
ThinkPad 750	9545-006	486SL-33	4M/20M	170M
	9545-008	486SL-33	4M/20M	340M
ThinkPad 750C	9545-306	486SL-33	4M/20M	170M
	9545-308	486SL-33	4M/20M	340M
ThinkPad 750Ce	9545	P24S-50/25	4M/20M	340M
ThinkPad 750Cs	9545	486SL-33	4M/20M	170M
	9545	486SL-33	4M/20M	340M
ThinkPad 750P	9545-40C	486SL-33	4M/20M	170M
	9545-40E	486SL-33	4M/20M	340M
ThinkPad 755C	9545	486DX4-50/25	4M/32M	170M
	9545	486DX4-50/25	4M/32M	340M
	9545	486DX4-50/25	4M/32M	540M
	9545	486DX4-75/25	4M/32M	170M
	9545	486DX4-75/25	4M/32M	340M
	9545	486DX4-75/25	4M/32M	540M
ThinkPad 755CD	9545	486DX4-100/33	8M/32M	540M
	9545	486DX4-100/33	8M/32M	810M
ThinkPad 755CDV	9545	486DX4-100/33	8M/32M	540M
	9545	486DX4-100/33	8M/32M	810M
ThinkPad 755Ce	9545	486DX4-100/33	8M/32M	340M
	9545	486DX4-100/33	8M/32M	540M
	9545	486DX4-100/33	8M/32M	810M

C Color
M Megabyte
P Pen
T Tablet
TPF ThinkPad File

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Model	Type	Processor	Memory	Hrd Dsk
ThinkPad 755Cs	9545	486DX4-50/25	8M/32M	170M
	9545	486DX4-50/25	8M/32M	340M
	9545	486DX4-50/25	8M/32M	540M
	9545	486DX4-75/25	8M/32M	170M
	9545	486DX4-75/25	8M/32M	340M
	9545	486DX4-75/25	8M/32M	540M
ThinkPad 755Cse	9545	486DX4-100/33	8M/32M	340M
	9545	486DX4-100/33	8M/32M	540M
	9545	486DX4-100/33	8M/32M	810M
ThinkPad 755CV	9545	486DX4-100/33	8M/32M	540M
	9545	486DX4-100/33	8M/32M	810M
ThinkPad 755CV	9545	486DX4-100/33	8M/32M	540M
	9545	486DX4-100/33	8M/32M	810M
ThinkPad 760C/CD	9546	Pentium-90	8M/40M	360M
	9546	Pentium-120	8M/40M	720M
	9546	Pentium-90	8M/40M	810M
	9546	Pentium-120	8M/40M	1.2G
ThinkPad 760E/ED	9546	Pentium-120	8M/80M	810M
	9546	Pentium-133	8M/80M	1.0G
	9546	Pentium-150	8M/80M	1.2G
	9546	Pentium-166	8M/80M	1.3G
	9546	Pentium-166	8M/80M	2.1G
ThinkPad 760EL/ELD	9547	Pentium-100	8M/80M	810M
	9547	Pentium-100	8M/80M	1.0G
	9547	Pentium-100	8M/80M	1.2G
	9547	Pentium-120	8M/80M	810M
	9547	Pentium-120	8M/80M	1.0G
	9547	Pentium-120	8M/80M	1.2G
	9547	Pentium-133	8M/80M	810M
	9547	Pentium-133	8M/80M	1.0G
	9547	Pentium-133	8M/80M	1.2G
ThinkPad 760L/LD	9546	Pentium-90	8M/40M	810M
	9546	Pentium-90	8M/40M	1.1G
	9546	Pentium-90	8M/40M	1.2G
	9546	Pentium-120	8M/40M	810M
	9546	Pentium-120	8M/40M	1.1G
	9546	Pentium-120	8M/40M	1.2G
ThinkPad 760X	9546	Pentium-150	32M/80M	3.0G
ThinkPad 760XD	9546	Pentium-166	32M/80M	3.0G
ThinkPad 760XL	9547	Pentium-166	16M/80M	2.1G
	9547	Pentium-166	16M/80M	3.0G
ThinkPad 765D	9546	Pentium MMX-166	32M/104M	3.0G
ThinkPad 765L	9547	Pentium MMX-166	32M/104M	3.0G
ThinkPad 770	9548, 9549	Pentium MMX-233	32M/256M	3.2G
ThinkPad 770	9548, 9549	Pentium MMX-233	32M/256M	4.0G
ThinkPad 770	9548, 9549	Pentium MMX-233	32M/256M	5.1G

C	Color	**T**	Tablet
M	Megabyte	**TPF**	ThinkPad File
P	Pen		

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Drive and Diskette Compatibility Matrix

The following table provides identification information for 3.5-inch drives.

Diskette Drive	Identifying Mark
3.5-Inch - 1.44MB	1.44 on the eject button
3.5-Inch - 2.88MB	2.88 on the eject button

The following table provides compatibility information for 3.5-inch diskettes and 3.5-inch diskette drives.

Diskette Capacity	1.44MB Drive	2.88MB Drive
1.0MB	Read/Write	Read/Write
2.0MB	Read/Write	Read/Write
4.0MB	Not Compatible	Read/Write

The following table provides identification information for 5.25-inch diskette drives.

Diskette Drive	Identifying Mark
5.25-Inch - 360KB (External)	Asterisk on bezel
5.25-Inch - 1.2MB (Internal)	1.2 on the eject button

The following table provides compatibility information for 5.25-inch diskettes and 5.25-inch diskette drives.

Diskette Capacity	360KB Drive	1.2MB Drive
360KB	Read/Write	Read/Write
1.2MB	Not Compatible	Read/Write

Note: A 360KB diskette written to or formatted on a 1.2MB drive can be read reliably only on a 1.2MB drive.

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Important Service Information

Important

Diskette fixes are customer installable. The diskette fixes are located on the PC Company Bulletin Board Service (BBS). The direct phone line for modem connection is 919-557-0001 or tieline 255-0001.

Advise customers to contact the PC Company HelpCenter at 800-772-2227 if they need assistance in obtaining or installing any diskette fixes.

Customers in Canada should call IBM HelpPC at 800-565-3344 for assistance or down-load information. The Canadian BBS phone numbers are:

Montreal	514-938-3022
Toronto	905-316-4255
Vancouver	604-664-6464
Winnipeg	204-934-2735

FRU Replacement Strategy

Before Replacing Parts

Ensure that all diskette fixes are installed prior to replacing any FRUs listed in this manual.

Use the following strategy to prevent unnecessary FRU replacement and service expense:

- **If you are instructed to replace a FRU and that does not correct the problem, reinstall the original FRU before you continue**.
- Some computers have both a processor board and a system board. If you are instructed to replace either the processor board or the system board, and the first board that you replaced does not correct the problem, reinstall the original board, then replace the other (processor or system) board.
- If an adapter or device consists of more than one FRU, an error code may be caused by any of the FRUs. Before replacing the adapter or device, remove the FRUs, one by one, to see if the symptoms change. Replace only the FRU that changed the symptoms.

Attention

A customized setup configuration (other than default settings) may exist on the computer you are servicing. Running Automatic Configuration may alter those settings. Note the current configuration settings (using the View Configuration option) and verify that the settings are in place when service is complete.

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The advanced diagnostic tests are intended to test *only* IBM products. Non-IBM products or modified options can give false errors and invalid responses.

Hard Disk Drive Replacement Strategy:

Always try to run a low-level format before replacing a hard disk drive.

Attention

The drive startup sequence in the computer you are servicing might have been changed. Be extremely careful during write operations such as copying, saving, or formatting. Data or programs can be overwritten if you select an incorrect drive.

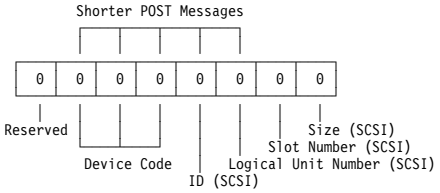
How to Use Error Messages

Use the error codes displayed on the screen to diagnose failures. If more than one error code is displayed, begin the diagnosis with the first error code. The cause of the first error code can result in false error codes being displayed. If no error code is displayed, see if the error symptom is listed in the Symptom-to-FRU Index for the computer you are servicing.

How to Read POST Error Messages

POST error messages are displayed on the screen as three, four, five, or eight digits. The error messages that can be displayed as shorter POST messages are highlighted in this index. Some digits will represent different information for SCSI errors versus non-SCSI errors.

The following example shows which digits display the shorter POST error messages and also defines the SCSI information in an eight-digit error message.



All SCSI devices are set to a different SCSI ID. Duplicate SCSI ID settings can generate a false error message. Use the SCSI ID to determine whether the error message is coming from an internal or an external device.

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Safety Notices (Multi-lingual Translations)

In this manual, safety notices appear in English with a page number reference to the appropriate multi-lingual, translated safety notice found in this section.

The following safety notices are provided in English, French, German, Italian, and Spanish languages.

Safety Notice 1

Before the computer is powered-on after FRU replacement, make sure all screws, springs, or other small parts are in place and are not left loose inside the computer. Verify this by shaking the computer and listening for rattling sounds. Metallic parts or metal flakes can cause electrical shorts.

Avant de remettre l'ordinateur sous tension après remplacement d'une unité en clientèle, vérifiez que tous les ressorts, vis et autres pièces sont bien en place et bien fixées. Pour ce faire, secouez l'unité et assurez-vous qu'aucun bruit suspect ne se produit. Des pièces métalliques ou des copeaux de métal pourraient causer un court-circuit.

Bevor nach einem FRU-Austausch der Computer wieder angeschlossen wird, muß sichergestellt werden, daß keine Schrauben, Federn oder andere Kleinteile fehlen oder im Gehäuse vergessen wurden. Der Computer muß geschüttelt und auf Klappergeräusche geprüft werden. Metallteile oder -splitter können Kurzschlüsse erzeugen.

Prima di accendere l'elaboratore dopo che é stata effettuata la sostituzione di una FRU, accertarsi che tutte le viti, le molle e tutte le altri parti di piccole dimensioni siano nella corretta posizione e non siano sparse all'interno dell'elaboratore. Verificare ciò scuotendo l'elaboratore e prestando attenzione ad eventuali rumori; eventuali parti o pezzetti metallici possono provocare cortocircuiti pericolosi.

Antes de encender el sistema despues de sustituir una FRU, compruebe que todos los tornillos, muelles y demás piezas pequeñas se encuentran en su sitio y no se encuentran sueltas dentro del sistema. Compruébelo agitando el sistema y escuchando los posibles ruidos que provocarían. Las piezas metálicas pueden causar cortocircuitos eléctricos.

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Safety Notice 2

Some standby batteries contain a small amount of nickel and cadmium. Do not disassemble it, recharge it, throw it into fire or water, or short-circuit it. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

Certaines batteries de secours contiennent du nickel et du cadmium. Ne les démontez pas, ne les rechargez pas, ne les exposez ni au feu ni à l'eau. Ne les mettez pas en court-circuit. Pour les mettre au rebut, conformez-vous à la réglementation en vigueur. Lorsque vous remplacez la pile de sauvegarde ou celle de l'horloge temps réel, veillez à n'utiliser que les modèles cités dans la liste de pièces détachées adéquate. Une batterie ou une pile inappropriée risque de prendre feu ou d'exploser.

Die Bereitschaftsbatterie, die sich unter dem Diskettenlaufwerk befindet, kann geringe Mengen Nickel und Cadmium enthalten. Sie darf nur durch die Verkaufsstelle oder den IBM Kundendienst ausgetauscht werden. Sie darf nicht zerlegt, wiederaufgeladen, kurzgeschlossen, oder Feuer oder Wasser ausgesetzt werden. Die Batterie kann schwere Verbrennungen oder Verätzungen verursachen. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Bereitschafts- oder Systembatterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

Alcune batterie di riserva contengono una piccola quantità di nichel e cadmio. Non smontarle, ricaricarle, gettarle nel fuoco o nell'acqua né cortocircuitarle. Smaltirle secondo la normativa in vigore (DPR 915/82, successive disposizioni e disposizioni locali). Quando si sostituisce la batteria dell'RTC (real time clock) o la batteria di supporto, utilizzare soltanto i tipi inseriti nell'appropriato Catalogo parti. L'impiego di una batteria non adatta potrebbe determinare l'incendio o l'esplosione della batteria stessa.

Algunas baterías de reserva contienen una pequeña cantidad de níquel y cadmio. No las desmonte, ni recargue, ni las eche al fuego o al agua ni las cortocircuite. Deséchelas tal como dispone la normativa local. Utilice sólo baterías que se encuentren en la lista de piezas. La utilización de una batería no apropiada puede provocar la ignición o explosión de la misma.

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Safety Notice 3

The battery pack contains small amounts of nickel. Do not disassemble it, throw it into fire or water, or short-circuit it. Dispose of the battery pack as required by local ordinances or regulations. Use only the battery in the appropriate parts listing when replacing the battery pack. Use of an incorrect battery can result in ignition or explosion of the battery.

La batterie contient du nickel. Ne la démontez pas, ne l'exposez ni au feu ni à l'eau. Ne la mettez pas en court-circuit. Pour la mettre au rebut, conformez-vous à la réglementation en vigueur. Lorsque vous remplacez la batterie, veillez à n'utiliser que les modèles cités dans la liste de pièces détachées adéquate. En effet, une batterie inappropriée risque de prendre feu ou d'exploser.

Akkus enthalten geringe Mengen von Nickel. Sie dürfen nicht zerlegt, wiederaufgeladen, kurzgeschlossen, oder Feuer oder Wasser ausgesetzt werden. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Batterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

La batteria contiene piccole quantità di nichel. Non smontarla, gettarla nel fuoco o nell'acqua né cortocircuitarla. Smaltirla secondo la normativa in vigore (DPR 915/82, successive disposizioni e disposizioni locali). Quando si sostituisce la batteria, utilizzare soltanto i tipi inseriti nell'appropriato Catalogo parti. L'impiego di una batteria non adatta potrebbe determinare l'incendio o l'esplosione della batteria stessa.

Las baterías contienen pequeñas cantidades de níquel. No las desmonte, ni recargue, ni las eche al fuego o al agua ni las cortocircuite. Deséchelas tal como dispone la normativa local. Utilice sólo baterías que se encuentren en la lista de piezas al sustituir la batería. La utilización de una batería no apropiada puede provocar la ignición o explosión de la misma.

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Safety Notice 4

The lithium battery can cause a fire, explosion, or severe burn. Do not recharge it, remove its polarized connector, disassemble it, heat it above 100°C (212°F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

La pile de sauvegarde contient du lithium. Elle présente des risques d'incendie, d'explosion ou de brûlures graves. Ne la rechargez pas, ne retirez pas son connecteur polarisé et ne la démontez pas. Ne l'exposez pas à une temperature supérieure à 100°C, ne la faites pas brûler et n'en exposez pas le contenu à l'eau. Mettez la pile au rebut conformément à la réglementation en vigueur. Une pile inappropriée risque de prendre feu ou d'exploser.

Die Systembatterie ist eine Lithiumbatterie. Sie kann sich entzünden, explodieren oder schwere Verbrennungen hervorrufen. Batterien dieses Typs dürfen nicht aufgeladen, zerlegt, über 100 C erhitzt oder verbrannt werden. Auch darf ihr Inhalt nicht mit Wasser in Verbindung gebracht oder der zur richtigen Polung angebrachte Verbindungsstecker entfernt werden. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Batterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

La batteria di supporto e una batteria al litio e puo incendiarsi, esplodere o procurare gravi ustioni. Evitare di ricaricarla, smontarne il connettore polarizzato, smontarla, riscaldarla ad una temperatura superiore ai 100 gradi centigradi, incendiarla o gettarla in acqua. Smaltirla secondo la normativa in vigore (DPR 915/82, successive disposizioni e disposizioni locali). L'impiego di una batteria non adatta potrebbe determinare l'incendio o l'esplosione della batteria stessa.

La bateria de repuesto es una bateria de litio y puede provocar incendios, explosiones o quemaduras graves. No la recargue, ni quite el conector polarizado, ni la desmonte, ni caliente por encima de los 100°C (212°F), ni la incinere ni exponga el contenido de sus celdas al agua. Deséchela tal como dispone la normativa local.

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Safety Notice 5

If the LCD breaks and the fluid from inside the LCD gets into your eyes or on your hands, immediately wash the affected areas with water for at least 15 minutes. Seek medical care if any symptoms from the fluid are present after washing.

Si le panneau d'affichage à cristaux liquides se brise et que vous recevez dans les yeux ou sur les mains une partie du fluide, rincez-les abondamment pendant au moins quinze minutes. Consultez un médecin si des symptômes persistent après le lavage.

Die Leuchtstoffröhre im LCD-Bildschirm enthält Quecksilber. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Der LCD-Bildschirm besteht aus Glas und kann zerbrechen, wenn er unsachgemäß behandelt wird oder der Computer auf den Boden fällt. Wenn der Bildschirm beschädigt ist und die darin befindliche Flüssigkeit in Kontakt mit Haut und Augen gerät, sollten die betroffenen Stellen mindestens 15 Minuten mit Wasser abgespült und bei Beschwerden anschließend ein Arzt aufgesucht werden.

Nel caso che caso l'LCD si dovesse rompere ed il liquido in esso contenuto entrasse in contatto con gli occhi o le mani, lavare immediatamente le parti interessate con acqua corrente per almeno 15 minuti; poi consultare un medico se i sintomi dovessero permanere.

Si la LCD se rompe y el fluido de su interior entra en contacto con sus ojos o sus manos, lave inmediatamente las áreas afectadas con agua durante 15 minutos como mínimo. Obtenga atención medica si se presenta algún síntoma del fluido despues de lavarse.

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Safety Notice 6

To avoid shock, do not remove the plastic cover that surrounds the lower portion of the inverter card.

Afin d'éviter tout risque de choc électrique, ne retirez pas le cache en plastique protégeant la partie inférieure de la carte d'alimentation.

Aus Sicherheitsgründen die Kunststoffabdeckung, die den unteren Teil der Spannungswandlerplatine umgibt, nicht entfernen.

Per evitare scosse elettriche, non rimuovere la copertura in plastica che avvolge la parte inferiore della scheda invertitore.

Para evitar descargas, no quite la cubierta de plástico que rodea la parte baja de la tarjeta invertida.

Safety Notice 7

Though main batteries have low voltage, a shorted or grounded battery can produce enough current to burn combustible materials or personnel.

Bien que le voltage des batteries principales soit peu élevé, le court-circuit ou la mise à la masse d'une batterie peut produire suffisamment de courant pour brûler des matériaux combustibles ou causer des brûlures corporelles graves.

Obwohl Hauptbatterien eine niedrige Spannung haben, können sie doch bei Kurzschluß oder Erdung genug Strom abgeben, um brennbare Materialien zu entzünden oder Verletzungen bei Personen hervorzurufen.

Sebbene le batterie di alimentazione siano a basso voltaggio, una batteria in corto circuito o a massa può fornire corrente sufficiente da bruciare materiali combustibili o provocare ustioni ai tecnici di manutenzione.

Aunque las baterías principales tienen un voltaje bajo, una batería cortocircuitada o con contacto a tierra puede producir la corriente suficiente como para quemar material combustible o provocar quemaduras en el personal.

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Safety Notice 8

Before removing any FRU, power-off the computer, unplug all power cords from electrical outlets, remove the battery pack, then disconnect any interconnecting cables.

Avant de retirer une unité remplaçable en clientèle, mettez le système hors tension, débranchez tous les cordons d'alimentation des socles de prise de courant, retirez la batterie et déconnectez tous les cordons d'interface.

Die Stromzufuhr muß abgeschaltet, alle Stromkabel aus der Steckdose gezogen, der Akku entfernt und alle Verbindungskabel abgenommen sein, bevor eine FRU entfernt wird.

Prima di rimuovere qualsiasi FRU, spegnere il sistema, scollegare dalle prese elettriche tutti i cavi di alimentazione, rimuovere la batteria e poi scollegare i cavi di interconnessione.

Antes de quitar una FRU, apague el sistema, desenchufe todos los cables de las tomas de corriente eléctrica, quite la batería y, a continuación, desconecte cualquier cable de conexión entre dispositivos.

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Safety Information

The following section contains the safety information that you need to be familiar with before servicing an IBM mobile computer.

General Safety

Follow these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during and after maintenance.
- When lifting any heavy object:
  1. Ensure you can stand safely without slipping.
  2. Distribute the weight of the object equally between your feet.
  3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
  4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles in your back. *Do not attempt to lift any objects that weigh more than 16 kg (35 lb) or objects that you think are too heavy for you.*
- Do not perform any action that causes hazards to the customer, or that makes the equipment unsafe.
- Before you start the machine, ensure that other service representatives and the customer's personnel are not in a hazardous position.
- Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Keep your tool case away from walk areas so that other people will not trip over it.
- Do not wear loose clothing that can be trapped in the moving parts of a machine. Ensure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
- Insert the ends of your necktie or scarf inside clothing or fasten it with a nonconductive clip, approximately 8 centimeters (3 inches) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.

  Attention: Metal objects are good electrical conductors.
- Wear safety glasses when you are: hammering, drilling soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.
- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
- Reinstall all covers correctly before returning the machine to the customer.

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Electrical Safety

Observe the following rules when working on electrical equipment.

Important

Use only approved tools and test equipment. Some hand tools have handles covered with a soft material that does not insulate you when working with live electrical currents.

Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges. Do not use this type of mat to protect yourself from electrical shock.

- Find the room emergency power-off (EPO) switch, disconnecting switch, or electrical outlet. If an electrical accident occurs, you can then operate the switch or unplug the power cord quickly.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Disconnect all power before:
  - Performing a mechanical inspection
  - Working near power supplies
  - Removing or installing main units
- Before you start to work on the machine, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box that supplies power to the machine and to lock the wall box in the off position.
- If you need to work on a machine that has *exposed* electrical circuits, observe the following precautions:
  - Ensure that another person, familiar with the power-off controls, is near you.

    Attention: Another person must be there to switch off the power, if necessary.
  - Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.

    Attention: There must be a complete circuit to cause electrical shock. By observing the above rule, you may prevent a current from passing through your body.
  - When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.
  - Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

  Observe the special safety precautions when you work with very high voltages; these instructions are in the safety sections of maintenance information. Use extreme care when measuring high voltages.

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- Regularly inspect and maintain your electrical hand tools for safe operational condition.
- Do not use worn or broken tools and testers.
- *Never assume* that power has been disconnected from a circuit. First, *check* that it has been powered-off.
- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts *with the power on* when they are removed from their normal operating places in a machine:
  - Power supply units
  - Pumps
  - Blowers and fans
  - Motor generators

  and similar units. (This practice ensures correct grounding of the units.)
- If an electrical accident occurs:
  - **Use caution; do not become a victim yourself.**
  - **Switch off power.**
  - **Send another person to get medical aid.**

Safety Inspection Guide

The intent of this inspection guide is to assist you in identifying potentially unsafe conditions on these products. Each machine, as it was designed and built, had required safety items installed to protect users and service personnel from injury. This guide addresses only those items. However, good judgment should be used to identify potential safety hazards due to attachment of non-IBM features or options not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- Electrical hazards, especially primary power (primary voltage on the frame can cause serious or fatal electrical shock).
- Explosive hazards, such as a damaged CRT face or bulging capacitor
- Mechanical hazards, such as loose or missing hardware

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The guide consists of a series of steps presented in a checklist. Begin the checks with the power off, and the power cord disconnected.

Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Power-off the computer. Disconnect the power cord.
3. Check the power cord for:
   a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and frame ground.
   b. The power cord should be the appropriate type as specified in the parts listings.
   c. Insulation must not be frayed or worn.
4. Remove the cover.
5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.
6. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

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Handling Electrostatic Discharge-Sensitive Devices

Any computer part containing transistors or integrated circuits (ICs) should be considered sensitive to electrostatic discharge (ESD). ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the machine, the part, the work mat, and the person handling the part are all at the same charge.

Notes

1. Use product-specific ESD procedures when they exceed the requirements noted here.
2. Make sure that the ESD protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people.
- Wear a grounded wrist strap against your skin to eliminate static on your body.
- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
- Select a grounding system, such as those listed below, to provide protection that meets the specific service requirement.

  Note

  The use of a grounding system is desirable but not required to protect against ESD damage.

  - Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
  - Use an ESD common ground or reference point when working on a double-insulated or battery-operated system. You can use coax or connector-outside shells on these systems.
  - Use the round ground-prong of the AC plug on AC-operated computers.

Grounding Requirements

Electrical grounding of the computer is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

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Laser Compliance Statement

Some IBM Personal Computer models are equipped from the factory with a CD-ROM drive. CD-ROM drives are also sold separately as options. The CD-ROM drive is a laser product. The CD-ROM drive is certified in the U.S. to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class 1 laser products. Elsewhere, the drive is certified to conform to the requirements of the International Electrotechnical Commission (IEC) 825 and CENELEC EN 60 825 for Class 1 laser products.

When a CD-ROM drive is installed, note the following.

CAUTION:

Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

O uso de controles, ajustes ou desempenho de procedimentos diferentes daqueles aqui especificados pode resultar em perigosa exposição à radiação.

凡未在这里指明的任何控制用法、调整、行为，

都会导致严重后果。

Pour éviter tout risque d'exposition au rayon laser, respectez les consignes de réglage et d'utilisation des commandes, ainsi que les procédures décrites.

Werden Steuer- und Einstellelemente anders als hier festgesetzt verwendet, kann gefährliche Laserstrahlung auftreten.

Az itt előírt eljárásoktól, beállításoktól és vezérlésektől eltérni a lézersugárzás veszélye miatt kockázatos !

L'utilizzo di controlli, regolazioni o l'esecuzione di procedure diverse da quelle specificate possono provocare l'esposizione a

Использование элементов настройки и выполнение процедур иных, чем указано здесь, может привести к опасному радиационному облучению.

Použitie kontrôl, úprav alebo iných vykonaní od iných výrobcov, ako je v tomto špecifikované, mohlo by mať za následok nebezpečenstvo vystavenia sa vyžiarovaniu.

El uso de controles o ajustes o la ejecución de procedimientos distintos de los aquí especificados

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puede provocar la exposición a radiaciones peligrosas.

Opening the CD-ROM drive could result in exposure to hazardous laser radiation. There are no serviceable parts inside the CD-ROM drive. **Do not open.**

Some CD-ROM drives contain an embedded Class 3A or Class 3B laser diode. Note the following.

DANGER:

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Radiação por raio laser ao abrir. Não olhe fixo no feixe de luz, não olhe diretamente por meio de instrumentos óticos e evite exposição direta com o feixe de luz.

开启时会有激光发射时，请勿盯视激光光束，请勿直接查看视觉仪器，并且避免直接接触在激光光束之中。

Rayonnement laser si carter ouvert. Évitez de fixer le faisceau, de le regarder directement avec des instruments optiques, ou de vous exposer au rayon.

Laserstrahlung bei geöffnetem Gerät. Nicht direkt oder über optische Instrumente in den Laserstrahl sehen und den Strahlungsbereich meiden.

Kinyitáskor lézersugár ! Ne nézzen bele se szabad szemmel, se optikai eszközökkel. Kerülje a sugárnyalábbal való érintkezést !

Aprendo l'unità vengono emesse radiazioni laser. Non fissare il fascio, non guardarlo direttamente con strumenti ottici e evitare l'esposizione diretta al fascio.

Открывая, берегитесь лазерного излучения. Не смотрите на луч, не разглядывайте его с помощью оптических инструментов, а также избегайте прямого воздействия лазерного луча.

Keď je laserová jednotka otvorená. Vyhnite sa priamemu pohľadu a nehľadte priamo s optickými nástrojmi do ľúča a vyhnite sa priamemu vystaveniu ľúčov.

Radiación láser al abrir. No mire fijamente ni examine con instrumental óptico el haz de luz. Evite la exposición directa al haz.

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Read This First

Before you go to the checkout guide, be sure to read this section.

Important Notes

- **Only certified trained personnel should service the computer**.
- Read FRU service procedures before replacing any FRUs.
- **Be extremely careful during write operations such as copying, saving, or formatting.** Drives in the computer that you are servicing might have been rearranged or the drive startup sequence might have been altered. If you select an incorrect drive, data or programs can be written over.
- **Replace FRUs only for the correct model.** When you replace the FRU, make sure the model of the machine and FRU part number are correct by referring to the part list.
- **FRUs should not be replaced because of a single, unreproducible failure.** Single failures can occur from a variety of reasons that have nothing to do with a hardware defect such as: cosmic radiation, electrostatic discharge, or software errors. FRU replacement should be considered only when a recurring problem exists. If this is suspected, clear the error log and run the test again. Do not replace any FRUs if log errors do not reappear.
- **Be careful not to replace a nondefective FRU.**

How to Use Error Messages: Use the error codes displayed on the screen to diagnose failures. If more than one error code is displayed, begin the diagnosis with the first error code. The cause of the first error code can result in false error codes being displayed. If no error code is displayed, see if the error symptom is listed in the "Symptom-to-FRU Index" on page 40.

Port Replicator Problems: If you suspect a problem with the Port Replicator, see "Port Replicator Checkout" on page 36.

How to Diagnose Multiple FRUs: When the adapter or device has more than one FRU, the error code could be caused by either FRU. Before replacing multiple FRUs, try removing or exchanging each FRU, one by one in the designated sequence, to see if the symptoms change.

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What to Do First: The servicer must include the following in the parts exchange form or parts return form that is attached to the returned FRU:

___ 1. Name and phone number of servicer
___ 2. Date of service
___ 3. Date when part failed
___ 4. Date of purchase
___ 5. Failure symptoms, error codes appearing on display, and beep symptoms
___ 6. Procedure index and page number in which failing FRU was detected
___ 7. Failing FRU name and part number
___ 8. Machine type, model number, and serial number
___ 9. Customer's name and address

Before checking problems with the computer, determine whether the damage is covered under the warranty by referring to the following:

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Warranty Notes

During the warranty period, the customer may be responsible for repair costs if the computer damage was caused by misuse, accident, modification, unsuitable physical or operating environment, or improper maintenance by the customer. The following list provides some common items that are not covered under warranty and some symptoms that may indicate the system was subjected to stresses beyond normal use:

The following is not covered under warranty:

- LCD panel cracked by applying excessive force or by being dropped
- Scratched (cosmetic) parts
- Cracked or broken plastic parts, broken latches, broken pins, or broken connectors caused by excessive force
- Damage caused by liquid spilled into the system
- Damage caused by improperly inserting a PCMCIA card or installation of an incompatible card
- Damage caused by foreign material in the FDD
- Diskette drive damage caused by pressing the diskette drive cover or inserting diskettes with multiple labels
- Damaged or bent diskette eject button
- CD-ROM drive damage caused by excessive forces shock, or by being dropped
- Fuses blown by nonsupported devices
- Forgotten computer password (making the computer unusable).

If the following symptoms are present, they may indicate damage caused by nonwarranted activity:

- Missing parts may be a symptom of unauthorized service or modification.
- HDD spindles can become noisy if subjected to excessive force or by being dropped.
- I9990303 errors can be caused by exposure to strong magnetic fields.

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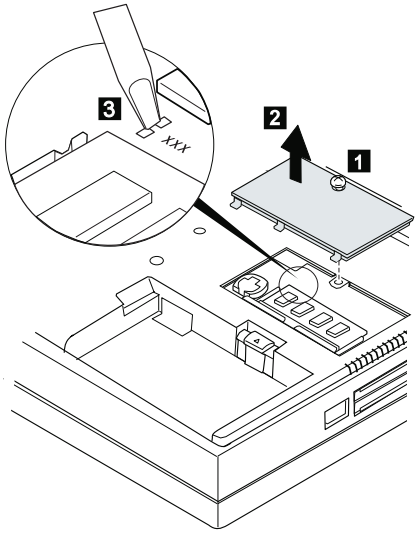
How to Disable the Power-On Password

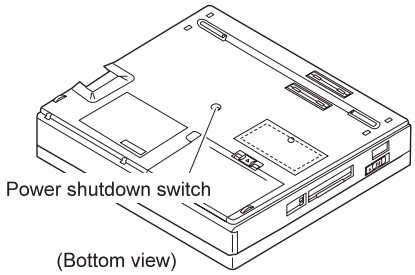
1. Power off the computer.
2. Turn the computer upside down, loosen the DIMM cover screw **1**, remove the DIMM cover **2**, then power on the computer by applying a short across the power-on password jumper pads **3**.

   Note: **xxx** in the following varies by model.
   - For models 380E and 385E: xxx = 345
   - For other models: xxx = 315



3. Verify that the password prompt does not appear. To reactivate the password, set the password again.

Power Shutdown Switch: The power shutdown switch resets the system regardless of the microcode status and forces the power off. Use this push button to power-off when power is not completely off or the microcode is in a hung state.



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Checkout Guide

Use the following procedure as a guide for computer problems.

Note: The diagnostic tests are intended to test only IBM products. Non-IBM products, prototype cards, or modified options can give false errors and invalid system responses.

1. Obtain the failing symptoms in as much detail as possible.
2. Verify the symptoms by attempting to re-create the failure by running the diagnostic test or by repeating the same operation.

   Note: To run the diagnostics, refer to "How to Run the Diagnostics" on page 54.

3. Use the following table with the verified symptom to determine which page to go to. Search the symptoms column and find the description that best matches your symptom; then go to the page shown in the "Go to" column.

Symptoms (Verified)	Go to
Power failure. (The power indicator does not go on or stay on.)	"Power Systems Checkout" on page 33.
POST does not complete. No beeps or error codes are displayed.	"Symptom-to-FRU Index" on page 40, and then use the **No Beep Symptoms** table.
POST beeps, but no error codes are displayed.	"Symptom-to-FRU Index" on page 40, and then use the **Beep Symptoms** table.
POST detected an error and displayed numeric error codes.	"Symptom-to-FRU Index" on page 40, and then use the **Numeric Error Codes** table.
The diagnostic test detected an error and displayed an FRU code.	"How to Run the Diagnostics" on page 54.
The configuration is not the same as the installed devices.	"Checking the Installed Devices List" on page 55.
Other symptoms (such as LCD display problems).	"Symptom-to-FRU Index" on page 40, and then use the **Other Symptoms** table.
Symptoms cannot be re-created. (Intermittent problems).	Use the customer reported symptoms and go to "Symptom-to-FRU Index" on page 40.

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Memory Checkout

DIMMs are available for increasing memory capacity.

DIMM	Displayed Value
No DIMM installed	16000KB
8MB	24192KB
16MB	32384KB
32MB	48768KB

Memory errors might stop system operations, show error messages on the screen, or hang the system.

Use the following procedure to isolate memory problems.

Note: Make sure that the DIMM is fully installed into the connector. A loose connection can cause an error.

1. Power off the computer and remove the DIMM from its slot (if installed).
2. Press and hold the **F1** key; then power on the computer. Hold the **F1** key down until the Easy-Setup screen appears.
3. Select **Test** and press Enter.
4. Select **Memory** and press Enter to run the memory test on base memory. If an error appears, replace the system board.
5. Power off the computer and reinstall the DIMM; then power on the computer. Verify the memory size; then test the memory. If an error appears, replace the DIMM.

If memory problems occur intermittently, use the loop option to repeat the test. When the test detects an error, an error log is printed on the printer connected to the parallel port. See “Error Log” on page 55 for more information.

System Programs in Flash Memory: System setup programs and diagnostic tests are stored in flash memory.

Flash Memory Update: A flash memory update is required for the following conditions:

- New versions of system programs.
- New features or options are added.

To update the flash memory, do the following:

1. Get the appropriate diskette containing the update.
2. Insert the **System Program Service Diskette** into drive A and power on the computer.
3. Select **Update system programs** from the menu.

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System Board Checkout

The processing functions are performed by the system board. When a numeric code calls the system board as a FRU, use the following procedure to isolate the problem.

1. Run the system board test to verify the symptom. This test verifies the system board. If no error is detected, return to “Checkout Guide” on page 29.
2. If FRU code 10 appears, replace the system board.
3. Rerun the test to verify the fix.

If this procedure does not correct the problem, go to “Undetermined Problems” on page 51.

Keyboard/Auxiliary Input Device Checkout

Remove the external keyboard if the internal keyboard is to be tested.

If the internal keyboard does not work or an unexpected character appears, make sure that the flexible cable extending from the keyboard is correctly seated in the connector on the subcard.

If the keyboard cable connection is correct, run the **keyboard test** by doing the following:

1. Go to the diagnostic menu screen by selecting **Test** in the Easy-Setup screen.
2. Press **Ctrl**+**A**. The ThinkPad FRU Connections screen appears. (If the **Ctrl**+**A** does not work, triple-click on the icon on the right bottom corner on the basic diagnostic screen.)
3. Make sure that the keyboard connection is **Connected**; then press **Esc** to escape the screen.
4. A layout of the keyboard appears on the screen. Check that when each key is pressed, the key's position on the keyboard layout on the screen changes to a black square.

   Note: When a **Fn** key is pressed, a black square briefly appears.
5. Press **Ctrl**+**Pause** to end the test.

If the tests detect a keyboard problem, do the following one at a time to correct the problem. **Do not replace a nondefective FRU**.

- Reseat the keyboard flexible cable.
- Replace the keyboard assembly.
- Replace the subcard.
- Replace the system board.

The following auxiliary input devices are supported for this computer:

- Numeric keypad
- Mouse (PS/2 compatible)
- External keyboard (with keyboard/mouse cable)

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If any of these devices do not work, reseat the cable connector and repeat the failing operation.

If the problem does not recur, recheck the connector.

If the problem is not corrected, replace the device, and then the system board.

TrackPoint III Checkout

If the TrackPoint III does not work, check the configuration in the ThinkPad Features program. If the configuration of the TrackPoint III is disabled, select **Enable** to enable it.

If this does not correct the TrackPoint III problem, continue with the following:

The TrackPoint III does automatic compensations to adjust the pointer sensor. During this process, the pointer moves on the screen automatically for a short time. This self-acting pointer movement can occur when a slight, steady pressure is applied to the TrackPoint III pointer while the computer is powered on or while the system is running, or when readjustment is required because the temperature has exceeded its normal temperature range. This symptom does not indicate a hardware problem. No service actions are necessary if the pointer movement stops in a short period of time.

If a click button problem or pointing stick problem occurs, do the following:

1. Go to the Easy-Setup screen.
2. Select an item with the pointing stick.
3. Press either the left or right click button.
4. Verify that both buttons work correctly.

If either the pointing stick or the click button does not work, do the following actions one at a time to correct the problem. Do not replace a nondefective FRU.

- Reseat the keyboard flexible cables.
- Replace the keyboard.
- Replace the subcard.
- Replace the system board.

Diskette Drive Test

Do the following to isolate the problem to a controller, drive, or diskette. A scratch, write enabled, nondefective 2HD diskette is required.

FDD-1 represents the built-in diskette drive. FDD-2 represents the external diskette drive attached through the port replicator.

Warning: Make sure that the diskette does not have more than one label attached to it. Multiple labels can cause damage to the drive or can cause the drive to fail.

Do the following to select the test device:

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1. Go to the advanced diagnostic mode by pressing **Ctrl**+**A** from the diagnostic menu.
2. Select **FDD-1** or **FDD-2** and press the spacebar. A √ mark appears next to the selection.
3. Press **Enter.**
4. Insert the **blank** diskette when instructed.
5. Type **Y** (Yes) to the question on the screen.
6. Select **FDD-1** or **FDD-2** and press **Enter** to run the diskette drive test.
7. If the controller test detects an error, FRU code 10 appears. Replace the system board.
8. If the controller test runs without errors, the drive read/write tests start automatically.
9. If the drive test detects an error, FRU code 50 for FDD-1; or 51 for FDD-2 appears. If the diskette itself is known to be good, replace the drive.

Status Indicator Checkout

If an LED problem occurs, do the following:

1. Power off the computer.
2. Power on the computer.
3. All the LEDs in the indicator panel should turn on for a moment soon after the computer is powered-on. Make sure that all LEDs turn on.

   If the problems remains, replace the following cards one at a time:

   - Subcard
   - System board

Power Systems Checkout

To verify the symptom of the problem, power on the computer using each of the power sources as follows.

1. Remove the battery pack.
2. Connect the AC Adapter and check that power is supplied.
3. Disconnect the AC Adapter and install the charged battery pack; then check that power is supplied by the battery pack.

If you suspect a power problem, see the appropriate power supply check listed below.

- “Checking the AC Adapter” on page 34.
- “Checking Operational Charging” on page 34.
- “Checking the Battery Pack” on page 35.
- “Checking the Backup Battery” on page 36.

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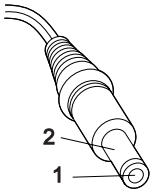
Checking the AC Adapter: You are here because the computer fails only when the AC Adapter is used.

- If the power problem occurs only when the port replicator is used, replace the replicator.
- If the power-on indicator does not turn on, check the power cord of the AC Adapter for correct continuity and installation.
- If the operational charge does not work, go to "Checking Operational Charging."

1. Unplug the AC Adapter cable from the computer and measure the output voltage at the plug of the AC Adapter cable. See the following figure:



Pin	Voltage (V dc)
1	+14.5 to +17.0
2	Ground

   - If the voltage is correct, do as follows:
     - If the problem is not corrected, replace the subcard.
     - If the problem is not corrected, replace the system board.
     - If the problem is not corrected, go to "Undetermined Problems" on page 51.
   - If the voltage is not correct, go to the next step.
2. Unplug the AC Adapter cable from the ac power outlet and wait 5 minutes or longer to allow the overvoltage protection circuit to be fully discharged and initialized.
3. Plug the AC Adapter cable into the ac power outlet.
4. Measure the output voltage of the AC Adapter.
5. If the voltage is still not correct, replace the AC Adapter.

Note: An audible noise from the AC Adapter does not always indicate a defective adapter.

Checking Operational Charging: To check operational charging, use a discharged battery pack or a battery pack that has less than 50% of the total power remaining when installed in the computer.

Perform operational charging. If the battery status indicator does not turn on, remove the battery pack and leave it to return to room temperature. Reinstall the

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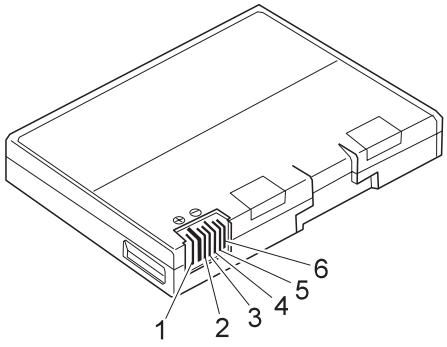
battery pack. If the charge indicator still does not turn on, replace the battery pack.

Checking the Battery Pack

1. Power off the computer.
2. Remove the battery pack and measure the voltage between battery terminals 1 (+) and 4 (–). See the following figure.



Terminal	Voltage (V dc) / Signal
1	**+0 to +13.5**
2	N/C
3	**Thermal**
4	**Ground (–)**
5	Select
6	**A-Ground**

Note: Signal lines not used in these steps are used for communication between the system and the battery.

3. If the voltage is less than +11.0 V dc, the battery pack has been discharged. Recharge the battery pack.

   If the voltage is still less than +11.0 V dc after recharging, replace the battery.

   Note: If the voltage of the battery pack is 0 V, it is not defective.

4. If the voltage is more than +11.0 V dc, measure the resistance between battery terminals 3 and 4. The resistance must be 4 to 30 K ohm.

   If the resistance is not correct, replace the battery pack.

   If the resistance is correct, replace the subcard.

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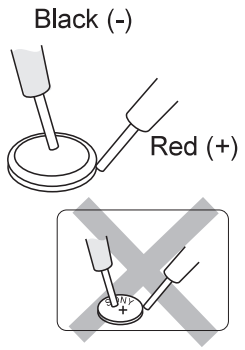
Checking the Backup Battery

1. Power off the computer and unplug the AC Adapter from the computer.
2. Turn the computer upside down.
3. Remove the DIMM cover and backup battery (see “1010 Battery Pack” on page 59).
4. Measure the voltage of the backup battery. See the following figure.

   Note: Be careful not to measure the wrong side of the backup battery.



Wire	Voltage (V dc)
Red	+2.5 to +3.7
Black	Ground

- If the voltage is correct, replace the system board.
- If the voltage is not correct, the backup battery has been discharged. Replace the backup battery.
- If the backup battery discharges quickly after replacement, replace the system board.

Common Device Checkout

If you suspect a common device problem, see the appropriate power supply check in the following list:

- “Port Replicator Checkout”
- “External Display Self-Test”

Port Replicator Checkout: Use the following procedure to isolate a port replicator problem. A port replicator attaches to the system expansion connector at the rear of the computer.

1. Power off the computer.
2. Remove the failing devices from the replicator.
3. Unplug the AC adapter from the replicator, if attached.
4. Remove the port replicator from the computer.

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5. Reconnect the failing device directly to the computer. (If another device is already connected to the computer, remove it first.)
6. Go to the “How to Run the Diagnostics” on page 54 and run the diagnostics.
7. If the advanced diagnostic device test does not find an error, suspect a problem with the port replicator of the system expansion bus.
8. Power off the computer and reconnect the port replicator.
9. Power on the computer and run the following advanced diagnostic tests:
   - Serial port test with the wrap plug installed on the replicator
   - Parallel port test with the wrap plug installed on the replicator
   - FDD-2 device test on the failing device with scratch diskette
10. If diagnostic errors appear, replace the replicator or diskette drive attachment unit.
    If the problem remains after the replacement, replace the system board.
11. If power problems appear only when the replicator is used, replace the replicator.

External Display Self-Test: If the display problem occurs only when using an external display, use the following instruction to correct the problem.

Note: Before you replace a display, check that the 95XX systems support either 63XX, 85XX, or 95XX displays to see if it is connected correctly.

If the screen is rolling, replace the external display. If that does not correct the problem, replace the FRUs in the following order until the problem goes away:

1. System board
2. Bus adapter (if used)

If the screen is not rolling, run the display self-test as follows:

1. Power-off the computer and display.
2. Disconnect the display signal cable.
3. Power-on the display
4. Set the contrast to its maximum position.
5. Set the brightness control to the center detent position.

Check for the following conditions:

- You should be able to vary the screen intensity by adjusting the contrast and brightness control.
- The screen should be white or light gray, with a black margin (test margin) on the screen.
- The screen is set to **CRT** or **both** by the ThinkPad Features program.

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Note: The location of the test margin varies with the type of display. The test margin might be on the top, bottom, or one or both sides.

If you do not see a test margin on the screen, replace the display. If there is a test margin on the screen, replace the system board.

Power Management Features

Three power management modes are provided by the computer to reduce power consumption and prolong battery power.

Standby Mode: When in standby mode the following occurs:

- The LCD backlight turns off.
- The hard disk motor stops.

Events that cause the computer to enter standby mode:

- Standby requested by the **Fn** key. (**Fn**+**F3**)
- No activity under **auto-standby** enabled by the ThinkPad Features program.

Events that cause the computer to exit or resume standby mode:

- (Resume) Any key operation.

Suspend Mode: When in suspend mode, the following, in addition to the three actions of standby mode, occur:

- The LCD is powered-off.
- The hard disk is powered-off.
- The CPU is stopped.

Notes:

1. In the ThinkPad Features Program, the computer can be set to “Will not suspend even if LCD is closed.”
2. When the computer is powered with ac power and is used with one of the communication PC cards, the computer enters *standby mode*; the PC card and application program remain active.
3. The computer cannot enter suspend mode while a communication link is running.

Events that cause the computer to enter suspend mode:

- Suspend mode is requested by the **Fn** key (**Fn**+**F4**).
- The LCD is closed.
- The specified time has elapsed from the last operation with the keyboard, mouse, hard disk drive, parallel connector, or diskette drive; or the AC Adapter is plugged in. The time is specified by ***Suspend Timer*** in the ThinkPad Features program.

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- The battery condition is low. The battery power indicator blinks orange.
- Either the *PS2 OFF* or *PS2 SUSpend* command is set in the ThinkPad Features program.

Events that cause the computer to exit or resume suspend mode:

- (Resume) The LCD is opened.
- (Resume) The real time clock alarm is signaled.
- (Resume) The ring indicator (RI) is signaled by a serial or PCMCIA device.
- (Resume) The **Fn** key is pressed.
- (Exit) Timer conditions are satisfied for entering hibernation mode.

Hibernation Mode: When in hibernation mode, the following occurs:

- The system status, RAM, VRAM, and setup data are stored on the hard disk.
- The system is powered-off.

> **Note:** The computer cannot enter hibernation mode when the computer is powered with ac power and a communication PC card is used.

Events that cause the computer to enter hibernation mode:

- Hibernation mode is requested by the **Fn** key (**Fn**+**F12**).
- Timer conditions are satisfied in suspend mode.
- A critical low battery condition occurs.
- The *PS2 HIB*ernation command is set in the ThinkPad Features program.

Event that causes the computer to exit hibernation mode.

- The power-on switch is operated.

When power is turned on, the hibernation history in the boot record on the hard disk is recognized and system status is restored from the hard disk to resume operation.

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Symptom-to-FRU Index

The Symptom-to-FRU Index lists the symptoms and errors and the possible causes. The most likely cause is listed first.

Note: Perform the FRU replacement or actions in the sequence shown in the "FRU/Action" columns. If a FRU did not solve the problem, put the original part back in the computer. Do not replace a nondefective FRU.

This index can also be used to help you decide which FRUs to have available when servicing a computer.

Numeric error codes show the errors detected in POST or system operation. In the following error codes, **X** can be any number.

If no codes are available, use narrative symptoms.

If the symptom is not listed, go to "Undetermined Problems" on page 51.

> **Note:** For IBM devices not supported by diagnostic codes in the ThinkPad notebook computers, see the manual for that device.

Numeric Error Codes

Symptom / Error	FRU / Action in Sequence
10X 101: Interrupt failure. 102: Timer failure. 103: Timer interrupt failure. 104: Protected mode failure. 105: Last 8042 command not accepted. 107: NMI test failure. 108: Timer bus test failure. 109: Low meg-chip select test.	**System board**
161 (Dead battery.)	1. **Go to "Checking the Backup Battery" on page 36.** 2. Backup battery 3. System board
163 (Time and Date was not set.)	1. **Set time and date.** 2. System board

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Symptom / Error	FRU / Action in Sequence
173 (Configuration data was lost.)	1. **Select OK in the error screen; then set the time and date.** 2. Backup battery 3. System board
174 (Configuration error: Perform“Checking the Installed Devices List” on page 55 before changing any FRUs.)	1. **Check Device Configuration.** 2. Hard disk drive 3. System board
184 (POP check sum error.)	**Reset the POP (power-on password) in Easy-Setup.**
190 (Depleted battery pack was installed when the power was on.)	**Go to “Checking the Battery Pack” on page 35.**
191XX (PM initialization error.)	**System board**
195 (The configuration read from the hibernation area does not match the actual configuration.)	**Check if the configuration was changed.** For example, check if the DIMM is added.
196 (Read error occurred in the hibernation area of the HDD.)	1. **Run the hard disk drive test.** 2. Hard disk drive
1XX	**System board**
2XX 201: Memory data error. 202: Memory line error 00–15. 203: Memory line error 16–23. 205: Memory test failure on on-board memory. 221: ROM to RAM remap error.	1. **Go to “Memory Checkout” on page 30.** 2. DIMM 3. System board
301, 303, 304, 305, 3XX (301: Keyboard error.)	1. **Go to “Keyboard/Auxiliary Input Device Checkout” on page 31.** 2. Keyboard 3. External numeric keypad 4. External keyboard 5. Keyboard/mouse cable 6. Subcard 7. System board

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Symptom / Error	FRU / Action in Sequence
601, 6XX (601: Diskette drive or controller error.)	1. **Go to "Diskette Drive Test" on page 32.** 2. FDD assembly 3. Diskette 4. System board
602 (Diskette read error.)	1. **Go to "Diskette Drive Test" on page 32.** 2. Diskette 3. FDD assembly
604 (Unacceptable ID was read from the diskette drive.)	1. **Go to "Diskette Drive Test" on page 32.** 2. FDD assembly 3. System board
11XX 1101: Serial_A test failure.	1. **Serial device** 2. Communication cable 3. System board
12XX 1201: Serial_B test failure.	**System board (Infrared)**
17XX 1701: Hard disk controller failure. 1780, 1790: Hard disk 0 error. 1781, 1791: Hard disk 1 error.	1. **Hard disk drive** 2. System board
24XX (2401: System board video error.)	**System board**
808X 8081: PCMCIA presence test failure. (PCMCIA revision number also checked.) 8082: PCMCIA register test failure.	1. **PCMCIA slot assembly** 2. PCMCIA device 3. System board
860X (Pointing device error when TrackPoint III is disabled.) 8601: System bus error–8042 mouse interface. 8602: External mouse error. 8603: System bus error or mouse error.	1. **External mouse** 2. External keyboard 3. System board
861X (Pointing device error when TrackPoint III is enabled.) 8611: System bus error–I/F between 8042 and IPDC. 8612: TrackPoint error. 8613: System board or TrackPoint error.	1. **Reseat the keyboard cables.** 2. Keyboard 3. External mouse 4. System board

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Symptom / Error	FRU / Action in Sequence
I9990301 **I9990302** **I9990305** I9990301: Hard disk error. I9990302: Invalid hard disk boot record. I9990305: No bootable device.	1. **Check that the operating system is installed in the HDD. If not, install the operating system.** 2. Reseat the boot device. 3. Check the startup sequence for the correct boot device. 4. Check that the operating system has no failure and is installed correctly.
I9990303 (Bank–2 flash ROM check sum error.)	**System board**
Other codes, not in this list	**Go to "Undetermined Problems" on page 51.**

Diagnostic Error Codes

A detected error is shown as in the following example:

- Large **X** on the left side of the device icon.
- Device ID (three digit)
- Error code (two digit)
- FRU code (four digit)

The device ID and error code are used to indicate the detail portion of the FRU that caused the error. If replacing a FRU does not correct the problem, see the device ID or error code from the previous failure. If they have changed, the cause might be because the new FRU is detective or that the FRU was incorrectly installed.

Device ID: If an error is detected by the diagnostic tests, a three-digits device ID is displayed. The device ID indicates suspected device.

Icon	Device ID	Suspected Device
SystemBoard	001	System board
	003	Keyboard
	007	Math coprocessor
	086	Pointing device
Memory	002	Memory

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Icon	Device ID	Suspected Device
Display	050	Display
	054	
HDD	017	Hard disk drive
FDD-1	006	(Internal) diskette drive
FDD-2	066	External diskette drive or FDD Connector of the port replicator
PCMCIA	080	PCMCIA
PCMCIA	088	External PCMCIA
Parallel	009	Parallel
Serial	011	Serial
CDROM	215	CD-ROM
Infrared	103	IR
Audio	153	Audio

FRU Codes: If an error is detected by the diagnostic tests, a four-digit FRU code is displayed. The FRU code indicates two suspected FRUs. No FRU is assigned to code 00. If only one FRU is suspected, the other FRU code is filled with zeros. Replace the FRU that is indicated by the **two leftmost** digits first; then replace the FRU that is indicated by the **two rightmost** digits. See the reference page before replacing the FRU. The suspected FRU name is also displayed on the screen. The following table shows the FRU code:

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FRU Code	FRU
10	System board
30	Reserved
32	External keyboard
33	External mouse
40	LCD unit
45	External CRT
50	1. Reseat the diskette drive (FDD-1) 2. Diskette drive (FDD-1)
51	1. Reseat the diskette drive (FDD-2) 2. Diskette drive (FDD-2)
60	1. Reseat the hard disk drive 2. Hard disk drive
70	PCMCIA-2 (Replicator)
72	PCMCIA slot assembly
90	CD-ROM drive

If the problem still remains after replacement of the FRUs, go to “Undetermined Problems” on page 51.

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Beep Symptoms

Symptom / Error	FRU / Action in Sequence
Continuous beeps.	**System board**
One beep and a blank, unreadable, or flashing LCD.	1. **Reseat the LCD connector**. 2. LCD unit 3. System board 4. Subcard
One beep, and the message "Unable to access boot source."	1. **Boot device** 2. System board
One long and two short beeps, and a blank or unreadable LCD.	1. **System board** 2. LCD unit
One long beep followed by four short beeps each time the power switch is operated. (System cannot power-on due to low battery voltage.)	**Connect the AC Adapter or install a fully charged battery.**
One beep every second. (System is shutting down due to low battery voltage.)	**Connect the AC Adapter or install a fully charged battery. (Allow the system to complete shutdown before changing the battery.)**
Two short beeps with error codes.	**POST error. See "Numeric Error Codes" on page 40.**
Two short beeps with blank screen.	**System board**

No Beep Symptoms

Symptom / Error	FRU / Action in Sequence
No beep, power-on indicator not on, and a blank LCD during POST.	1. **Go to "Power Systems Checkout" on page 33.** 2. System board 3. Subcard 4. Power sources
No beep, power-on indicator on, and a blank LCD during POST.	1. **System board** 2. Subcard
No beep, power-on indicator on, and a blinking cursor only during POST.	1. **System board** 2. Subcard
No beep during POST but system runs correctly.	1. **Turn the volume up and check the speaker.** 2. Speaker 3. System board 4. Subcard

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LCD-Related Symptoms

Important

The LCD for the notebook computer contains over 921 000 thin-film transistors (TFTs). A small number of missing, discolored, or lighted dots (on all the time) is characteristic of TFT LCD technology, but excessive pixel problems can cause viewing concerns. The LCD should be replaced if the number of dots satisfies the following condition:

- The number of missing, discolored, or lighted dots in any background is 21 or more.

Symptom / Error	FRU / Action in Sequence
No beep, power-on indicator on, and a blank LCD during POST.	1. **System board** 2. Subcard
• LCD backlight not working • LCD too dark • LCD brightness cannot be adjusted (TFT) • LCD contrast cannot be adjusted (STN)	1. **Reseat the LCD connectors.** 2. LCD unit 3. Subcard
• LCD screen unreadable • Characters missing pels • Screen abnormal • Wrong color displayed	1. **See important note for "LCD-Related Symptoms."** 2. Reseat all LCD connectors. 3. LCD unit 4. System board 5. Subcard
LCD has extra horizontal or vertical lines displayed.	**LCD unit**

Keyboard/TrackPoint III-Related Symptoms

Symptom / Error	FRU / Action in Sequence
Keyboard (one or more keys) does not work.	1. **Reseat the keyboard cable on the subcard**. 2. Keyboard 3. Subcard 4. System board
TrackPoint III does not work.	1. **Reseat the keyboard cable on the subcard.** 2. Go to "TrackPoint III Checkout" on page 32. 3. Keyboard 4. Subcard 5. System board

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Symptom / Error	FRU / Action in Sequence
Pointer moves automatically or does not work correctly.	**See "TrackPoint III Checkout" on page 32.**

Indicator-Related Symptoms

Symptom / Error	FRU / Action in Sequence
Indicator incorrectly remains off or on, but system runs correctly.	**1. Subcard** 2. System board
Battery power status indicator blinks from green, yellow, to orange.	1. **Check that a correct battery is installed.** 2. Battery pack 3. Subcard 4. System board

Power-Related Symptoms

Symptom / Error	FRU / Action in Sequence
Power shuts down during operation.	1. **Go to "Power Systems Checkout" on page 33.** 2. Battery pack 3. Remove the battery pack and let it cool for two hours. 4. Subcard 5. Power sources
The system will not power-off. (See "Power Shutdown Switch" on page 28.)	1. **Press the power shutdown switch.** 2. System board

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Function/Audio-Related Symptoms

Symptom / Error	FRU / Action in Sequence
The system does not suspend or resume when the LCD is opened or closed.	1. **Go to "Suspend Mode" on page 38, and check that the computer can enter suspend mode.** 2. Boot an operating system and press **Fn+F4**. If the computer enters suspend mode, suspect that the application program is not working properly. 3. Subcard 4. System board
Battery Fuel-Gauge does not go higher than 90%.	**Go to "Checking the Battery Pack" on page 35 and see the note.**
Memory count (size) appears different from actual size.	**Go to "Memory Checkout" on page 30.**
System configuration does not match the installed devices.	**Go to "Checking the Installed Devices List" on page 55.**
System hangs intermittently.	**Go to "Intermittent Problems" on page 50.**

Peripheral-Device-Related Symptoms

Symptom / Error	FRU / Action in Sequence
External display does not work correctly.	**See "External Display Self-Test" in "Common Devices Checkout" section.**
Printer problems.	1. **Run Printer Self-test**. 2. Parallel port device 3. Cable 4. System board
Serial or parallel port device problems.	1. **Device** 2. Device cable 3. System board

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Infrared-Related Symptoms

Symptom / Error	FRU / Action in Sequence
Unable to communicate using the Infrared (IR) Port.	1. **Make sure the setup for the IR is correct.** 2. Make sure there are no fluorescent lights near the computer. The computer may receive optical noise from the fluorescent light. 3. Run the advanced diagnostic test. If an error occurs and a FRU code is displayed, replace the parts shown by the FRU code.

Other Symptoms

Symptom / Error	FRU / Action in Sequence
Errors occur only when Port Replicator is used.	**See "Port Replicator Checkout" on page 36.**
PCMCIA slot pin is damaged.	**PCMCIA Slot Assembly**

Note: If you cannot find a symptom or error in this list and the problem remains, see "Undetermined Problems" on page 51.

Intermittent Problems

Intermittent system hang problems can be caused by a variety of reasons that have nothing to do with a hardware defect, such as: cosmic radiation, electrostatic discharge, or software errors. FRU replacement should be considered only when a recurring problem exists.

When analyzing the intermittent problem, do the following:

1. Run the advanced diagnostic test for the system board in loop mode at least 10 times.
2. If no error is detected, do **not** replace any FRUs.
3. If any error is detected, replace the FRU shown by the FRU code. Rerun the test to verify that no more errors exist.

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Undetermined Problems

You are here because the diagnostic tests did not identify which adapter or device failed, installed devices are incorrect, a short circuit is suspected, or the system is inoperative. Follow the procedures below to isolate the failing FRU (do not isolate nondefective FRUs).

Verify that all attached devices are supported by the computer.

Verify that the power supply being used at the time of the failure is operating correctly. (See "Power Systems Checkout" on page 33.)

1. Power off the computer.
2. Check the cables, wires, and connectors for short circuits and open circuits. Visually check them for damage. If any problems are found, replace the FRU.
3. Remove or disconnect all of the following devices.
   a. Non-IBM devices
   b. Devices attached to the expansion bus connector
   c. Printer, mouse, and other external devices
   d. Battery pack
   e. Hard disk drive
   f. Diskette drive
   g. DIMM card
   h. PC Cards
4. Power on the computer.
5. Determine if the problem has changed.
6. If the problem does not occur again, reconnect the removed devices one at a time until you find the failing FRU.
7. If the problem remains, replace the following FRUs one at a time. Do not replace a non-defective FRU.
   - Subcard
   - System board

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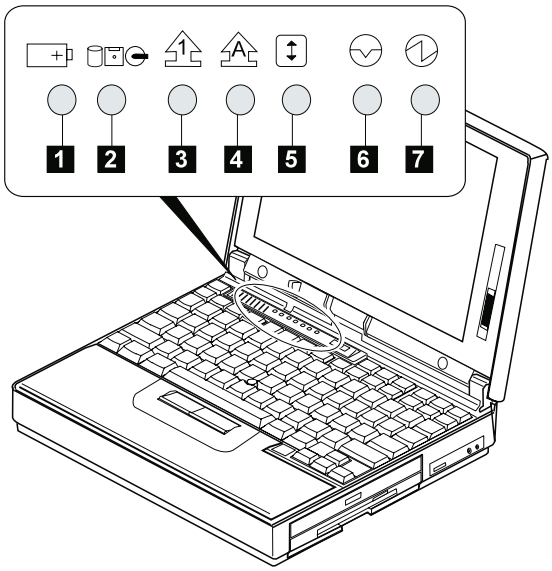
Related Service Procedures

This section provides information about the following:

- “Status Indicators”
- “How to Run the Diagnostics” on page 54
- “Error Log” on page 55
- “Checking the Installed Devices List” on page 55
- “How to Run a Low-Level Format” on page 55
- “PC Test Card LED” on page 56
- “Fn Key Combinations” on page 56
- “Keyboard/Auxiliary Input Device Checkout” on page 31

Status Indicators

The system status indicators show the current computer status in different colors (green and orange).



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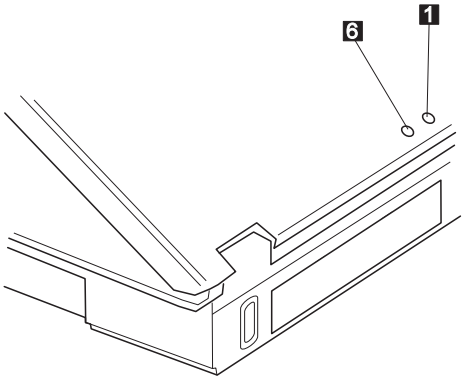

(Rear view)

Symbol	Color	Meaning
1 Battery	Green	Enough battery power remains for operation.
	Orange	Battery pack is charging.
	Blinking orange	Battery pack needs charging.
2 Device Access	Orange	Data is read from or written to the hard disk drive, FDD, or CD-ROM drive.
3 Numeric Lock	Green	Numeric keypad on the keyboard is enabled.
4 Caps Lock	Green	Caps lock mode is enabled.
5 Scroll Lock	Green	Arrow keys can be used as screen-scroll function key.
6 Suspend Mode	Green	Suspend mode
7 Power On	Green	Power on

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How to Run the Diagnostics

Use either the TrackPoint III or the cursor move keys to interact with the tests. Pressing the **Enter** key works the same as selecting the OK icon to reply **OK**.

Note: The following tools are required:

FDD:	Erasable 2HD diskette
Parallel:	Wrap plug (P/N 72X8546)
Serial:	Wrap plug (P/N 72X8546)
PCMCIA:	PC Test Card (P/N 35G4703)
CDROM:	Any CD (data CD is recommended)

1. Press and hold the F1 key; then power on the computer. Hold the F1 key down until the Easy-Setup screen appears.
2. Select **Test** and press **Enter**.
3. Select a device and press **Enter** to run the test.
4. The test progress screen appears.
5. **OK** appears when the test ends without any errors.
6. Start the **Advanced Diagnostic test** as either of the following way:
   - Pressing **Ctrl**+**A** on the basic diagnostic menu screen.
   - Triple-click the icon on the right bottom corner on the basic diagnostic screen.
7. The ThinkPad FRU Connections screen appears. This screen shows the state of the connection of all connectors.

   Check the connector if the **Not connected** message appears on the screen.
8. Click on **Exit** on the screen or press **Esc** to exit the screen.
9. The keyboard test screen appears.

   Check the keyboard.
10. Click on **Exit** on the screen or press **Ctrl**+**Pause** to exit the screen.
11. Select a device and press **Enter** to start the tests.

    The instruction appears, and follow the instruction on the screen.
12. Select **Test All** to test all devices.
13. Select **Loop Test** to run the tests in a repeated loop.

    A loop option menu appears in which a device loop or all-device loop can be selected. Select a device and press the **Spacebar** to select a device. Repeat this step to select multiple devices. Press Enter to start the diagnostic loop. If no device is selected, all device tests are looped.
14. To exit the loop, keep pressing **Ctrl**+**Pause** until the test exits. A beep sounds to notify that the exit interrupt is sensed by the test program.

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Error Log

Diagnostic errors are printed on the printer that is attached to the parallel port when the error is detected. The error is also logged in the system memory.

Do the following to display the errors:

1. End the test, if it is running.
2. Press **Ctrl**+**A** to select the advanced diagnostic mode.
3. Press **Esc** to exit the ThinkPad FRU Connections screen.

   The keyboard test screen appears.
4. Press **Ctrl**+**Pause** to exit the keyboard test screen.
5. Press **Ctrl**+**E**.
6. The error log appears.
7. To exit the screen, select the cancel icon or press **Esc**.

The error log is not saved when the system is powered-off.

Checking the Installed Devices List

If a device is installed but the icon appears in a gray shade rather than a dark shade on the basic diagnostics screen, the device is defective. Reseat the device connectors. If the symptom remains, replace the device or the system board. If needed, adjust the contrast control to clearly distinguish the shades of the icon.

If a device that is not installed appears in a dark shade (for example, FDD-2 appears in a dark shade when *NO* second FDD is installed), do the following:

1. Replace the **first** device in the configuration, such as an FDD-1.
2. If the problem remains, replace the system board.

The Parallel, and Serial icons are always displayed in a dark shade because the icons represent subsystems of the system board and not the attachment of the devices.

The FDD-1 and PCMCIA-1 icons represent the drive in the computer. The FDD-2 and PCMCIA-2 icons represent the devices in the port replicator or that is attached through the port replicator.

How to Run a Low-Level Format

Do the following to format the hard disk.
Warning: Make sure the drive address to be formatted is correct. This procedure erases all information on the disk.

1. Power off the computer.
2. Insert the **ThinkPad hardware maintenance diskette Ver 1.30** into diskette drive **A** and power on the computer.
3. Select **Format the hard disk** from the main menu.
4. Select the drive from the menu.
5. Follow the instructions on the screen.

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PC Test Card LED

The green LED on the PC test card turns on when the PCMCIA test is running. If the LED does not turn on, check that the card is installed correctly by reseating the card. If it still does not turn on after it is reseated, try using another slot for the test. If the LED still does not turn on and the test fails, replace the FRU shown by the diagnostic error code.

Fn Key Combinations

The following table shows the **Fn** key and function key combinations and their corresponding functions.

The **Fn** key works independently from the operating system. The operating system obtains the status through the system management interface to control the system.

Fn +	**Description**
F1	Reserved
F2	Fuel-Gauge display on or off
F3	Standby mode invocation
F4	Suspend mode invocation
F5	Reserved
F6	Reserved
F7	LCD/CRT display switching
F8	Screen expansion on or off (no symbol on the key)
F9	Reserved
F10	Reserved
F11	Power management mode switching (toggles High Power, Intelligent, Economy)
F12	Hibernation invocation

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Product Overview (380, 385)

The following table shows an overview of the system features.

Feature	Description
Processor	**380/380D/385/385D** • Intel® Pentium® 150/60 MHz, 256K L2 cache • Intel Pentium MMX™ 150 MHz, 256K L2 cache **380E/380ED/385E/385ED** • Intel Pentium MMX 166 MHz, 256K L2 cache
Bus architecture	PCI bus
Memory (standard)	16MB (on system board)
Memory (option) (One 144-pin DIMM slot)	8MB, 16MB, 32MB non parity DIMM (max. 48MB)
CMOS RAM	242 bytes
Video	• 12.1-inch, 64K colors, 800×600 pixel DSTN color LCD • 12.1-inch, 256K colors, 800×600 pixel TFT color LCD
Diskette drive	1.44MB (3-mode), 3.5-inch
CD-ROM drive	8X transfer speed
Hard disk drive	**380/380D/385/385D** • 1.08GB, 2.5-inch, IDE interface • 1.4GB, 2.5-inch, IDE interface • 2.1GB, 2.5-inch, IDE interface **380E/380ED/385E/385ED** • 2.1GB, 2.5-inch, IDE interface • 3 GB, 2.5-inch, IDE interface • 5 GB, 2.5-inch, IDE interface
I/O port	• Headphone • Microphone • Port replicator
Audio	• 16-bit audio • Internal speaker • Internal microphone • Mechanical volume
Infrared transfer	• 4 million bps serial communication • Transmitter and receiver module
PC Card slots	• One Type-III or two Type-II • ZV port

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FRU Removals and Replacements

This section contains information about removals and replacements.

- Do not damage any part. Only certified and trained personnel should service the computer.
- The arrows in the “Removals and Replacements” section show the direction of movement to remove a FRU, or to turn a screw to release the FRU. The arrows are marked in numeric order, in square callouts, to show the correct sequence of removal.
- When other FRUs must be removed before removing the failing FRU, they are listed at the top of the page.
- To replace a FRU, reverse the removal procedure and follow any notes that pertain to replacement. See “Locations” for internal cable connections and arrangement information.
- When replacing a FRU, use the correct screw size as shown in the procedures.

Safety Notice 1: Translation on page 8

Before the computer is powered-on after FRU replacement, make sure all screws, springs, or other small parts, are in place and are not left loose inside the computer. Verify this by shaking the computer and listening for rattling sounds. Metallic parts or metal flakes can cause electrical short circuits.

Safety Notice 3: Translation on page 10

The battery pack contains small amounts of nickel. Do not disassemble it, throw it into fire or water, or short-circuit it. Dispose of the battery pack as required by local ordinances or regulations.

Safety Notice 8: Translation on page 14

Before removing any FRU, power-off the computer, unplug all power cords from electrical outlets, remove the battery pack, and then disconnect any interconnecting cables.

Safety Notice 4: Translation on page 11

The lithium battery can cause a fire, explosion, or severe burn. Do not recharge it, remove its polarized connector, disassemble it, heat it above 100°C (212°F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

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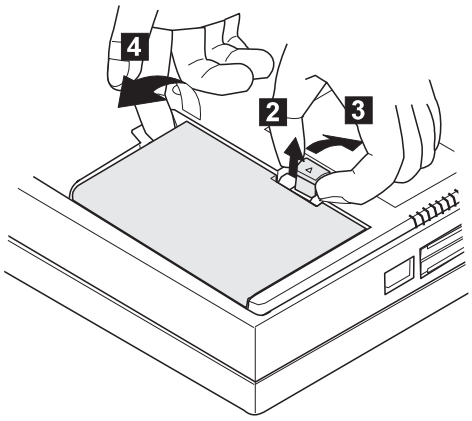
1010 Battery Pack

1 Turn the computer upside down.

Pull up the battery pack lock **2**, push it back **3**, and then pull up the battery pack **4**.



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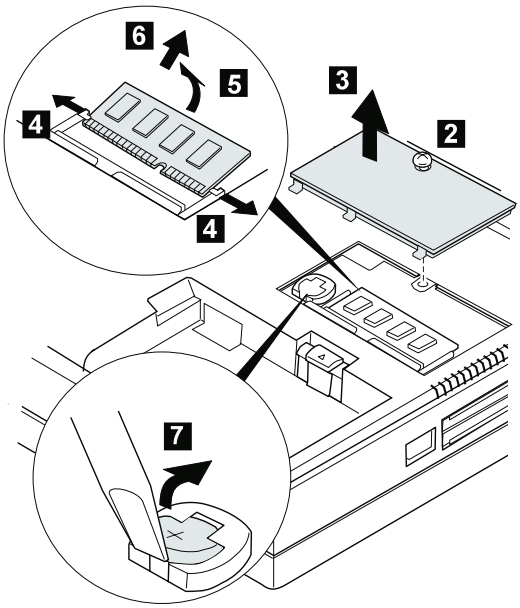
1020 DIMM Card / Backup Battery

Safety Notice 4: Translation on page 11

The lithium battery can cause a fire, explosion, or severe burn. Do not recharge it, remove its polarized connector, disassemble it, heat it above 100°C (212°F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

1 Turn the computer upside down.

2 3 4 5 6 : DIMM
2 3 7 : Backup battery



When replacing:

Make sure the plus side is on top when replacing the backup battery.

Step	Size (Quantity)	Torque
2	—	4 kgcm
Note: Only loosen the screw in step 2 .		

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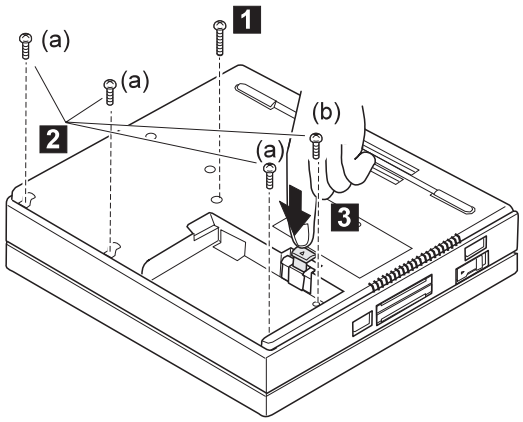
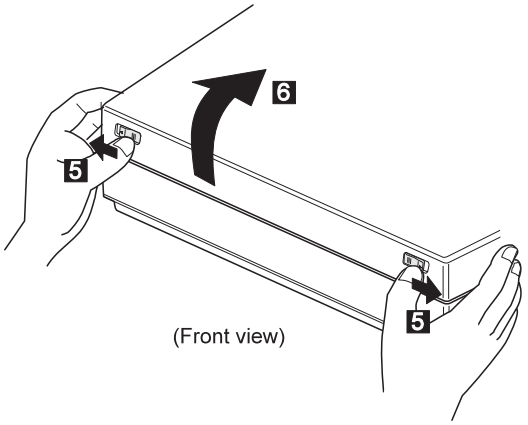
1030 Keyboard Unit

- Battery Pack **(1010)**



Step	Size (Quantity)	Torque
1	M 2.5 x 25mm, Nylon (1)	3 kgcm
2	**(a)**M 2.5 x 8mm, Nylon (3) **(b)**M 2.5 x 6mm, Nylon (1)	3 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

4 Turn the computer over again.



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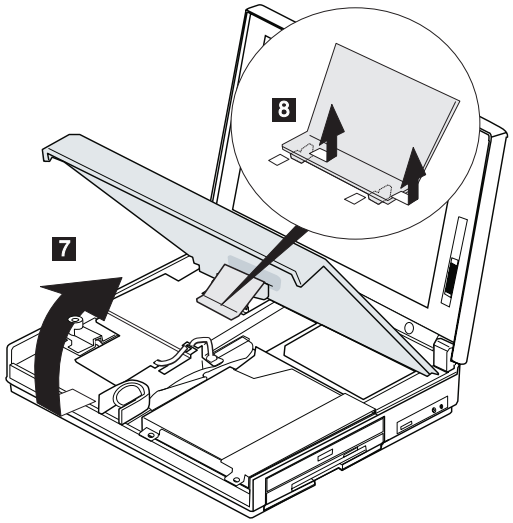
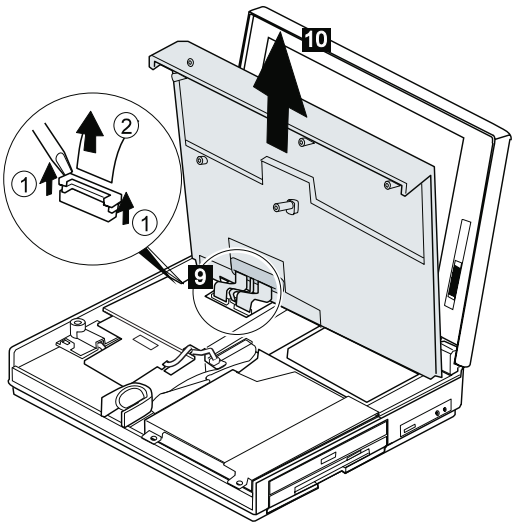
Note: Pull the keyboard assembly forward **a little** in step 7 .





When replacing:

When replacing the keyboard, put the name label on it.

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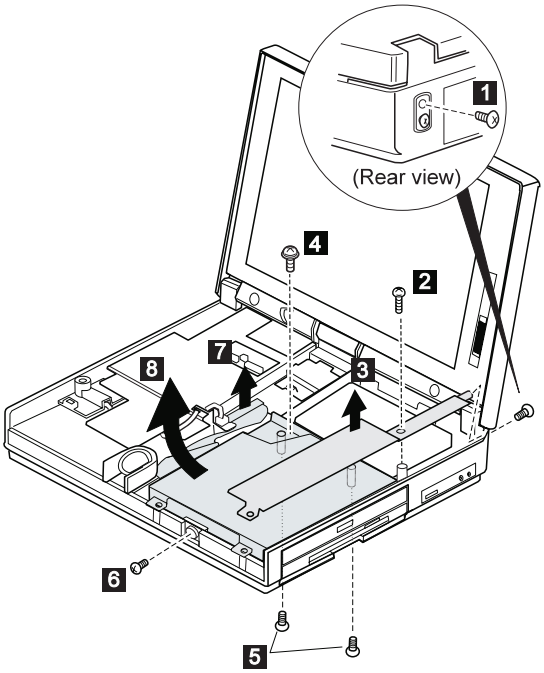
1040 CD-ROM/FDD Assembly

- Battery Pack **(1010)**
- Keyboard Unit **(1030)**

Note: Be careful that the computer does not fall backward when the CD-ROM/FDD assembly is removed.

Models 380, 380D, 385, and 385D



Step	Size (Quantity)	Torque
1	M 2.5 x 6mm, Nylon (1)	4 kgcm
2	M 2.5 x 6mm (1)	4 kgcm
4	M 2.5 x 6mm, Special head (1)	3 kgcm
5	M 2.5 x 8mm, Nylon (2)	3 kgcm
6	M 2.5 x 6mm (1)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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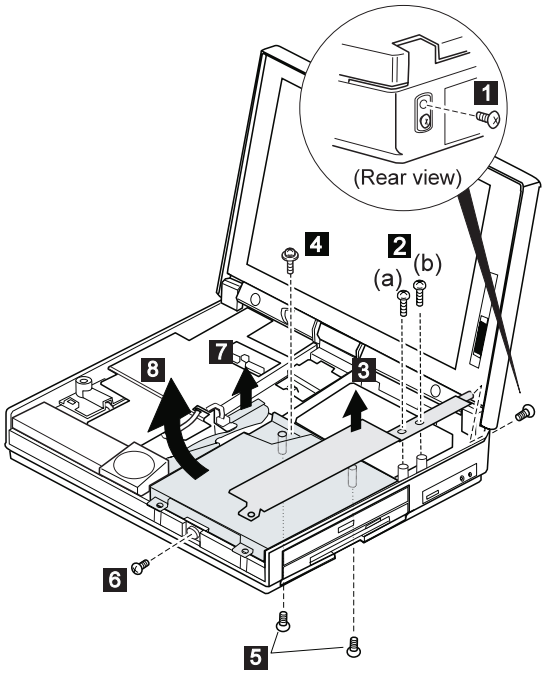
Models 380E, 380ED, 385E, and 385ED



Step	Size (Quantity)	Torque
1	M 2.5 x 6mm, Nylon (1)	4 kgcm
2	M 2.5 x 6mm (2)	**(a)** 3 kgcm **(b)** 4 kgcm
4	M 2.5 x 6mm, Special head (1)	3 kgcm
5	M 2.5 x 8mm, Nylon (2)	3 kgcm
6	M 2.5 x 6mm (1)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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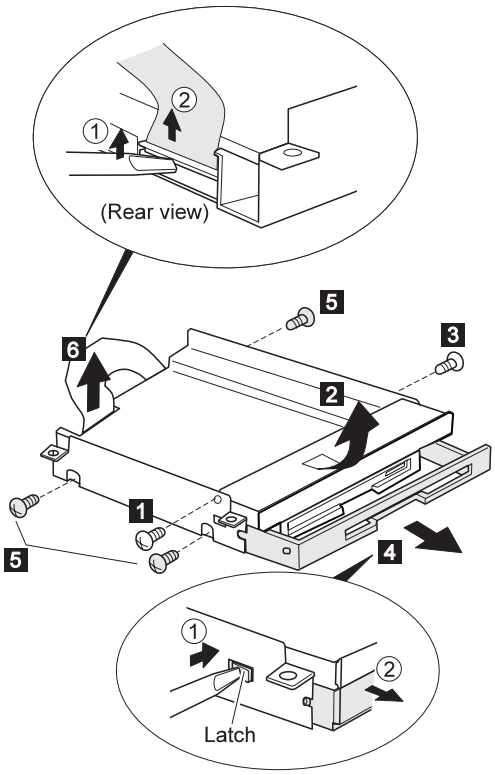
1045 FDD

- Battery Pack **(1010)**
- Keyboard Unit **(1030)**
- CD-ROM/FDD Assembly **(1040)**

Models 380 and 380E

1 **2** : Blank Bezel
3 **4** : FDD Bezel
3 **4** **5** **6** : FDD



Step	Size (Quantity)	Torque
1	M 2.6 x 4mm (1)	4 kgcm
3	M 2.6 x 4mm (1)	4 kgcm
5	M 2.6 x 2.8mm, Red screw (3)	4 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

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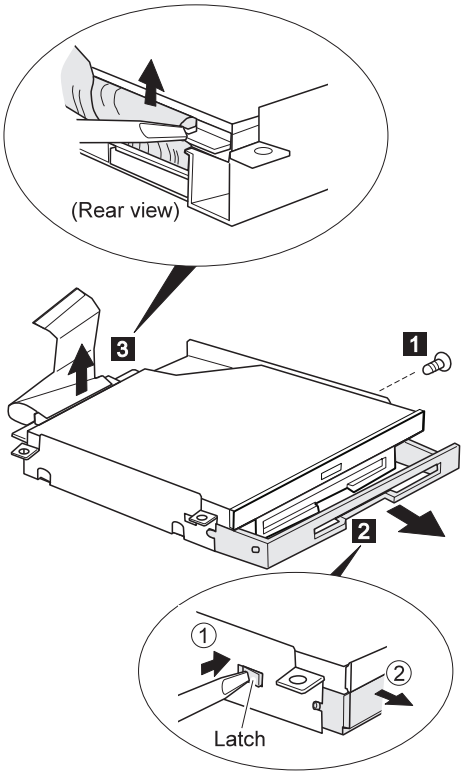
Models 380D, 380ED, 385D, and 385ED

1 2 : FDD Bezel
1 2 3 4 5 6 : FDD



Step	Size (Quantity)	Torque
1	M 2.6 x 4mm (1)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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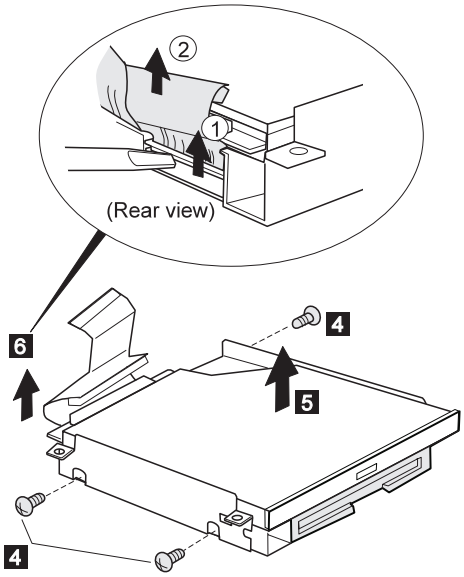

Step	Size (Quantity)	Torque
4	M 2.6 x 2.8mm, Red screw (3)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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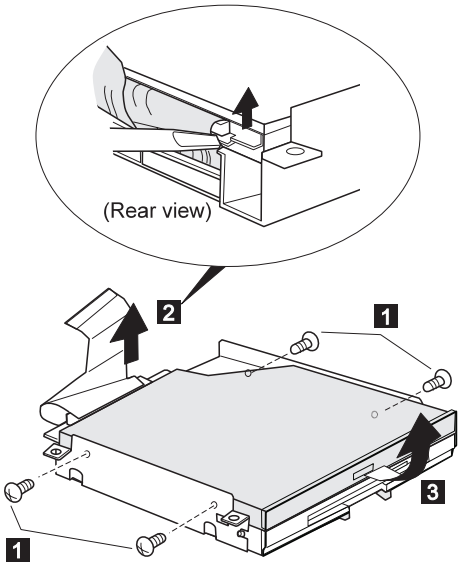
1046 CD-ROM

- Battery Pack **(1010)**
- Keyboard Unit **(1030)**
- CD-ROM/FDD Assembly **(1040)**

8X CD-ROM (73H9933)



Step	Size (Quantity)	Torque
1	M 2 x 2.4mm, Special head (4)	1.5 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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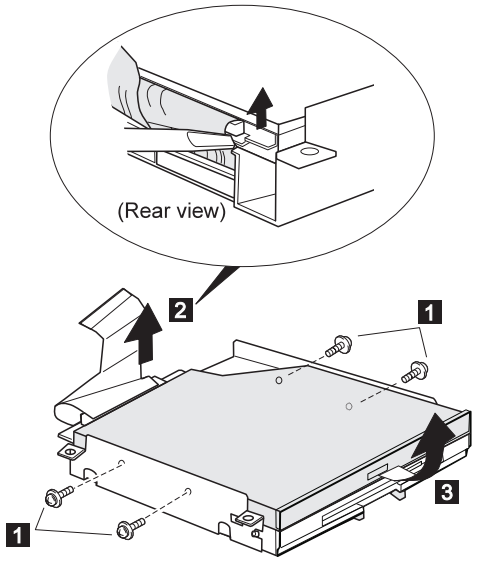
8-20X CD-ROM (12J0115)



Step	Size (Quantity)	Torque
1	M 2 x 1.7mm, Special head (4)	1.5 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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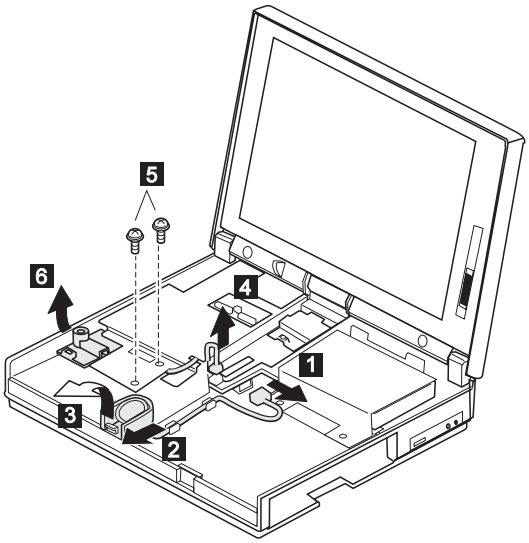
1050 Speaker / Microphone

- Battery Pack **(1010)**
- Keyboard Unit **(1030)**
- CD-ROM/FDD Assembly **(1040)**

Models 380, 380D, 385, and 385D

1 2 3 : Speaker
4 5 6 : Microphone

Note: To remove the microphone easily, pull up the upper shield slightly.



Step	Size (Quantity)	Torque
5	M 2.5 x 6, Special head (2)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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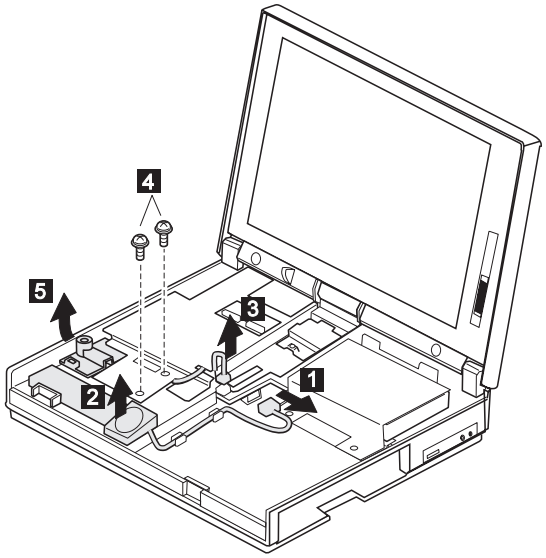
Models 380E, 380ED, 385E, and 385ED

1 2 : Speaker
3 4 5 : Microphone

Note: To remove the microphone easily, pull up the upper shield slightly.



Step	Size (Quantity)	Torque
4	M 2.5 x 6, Special head (2)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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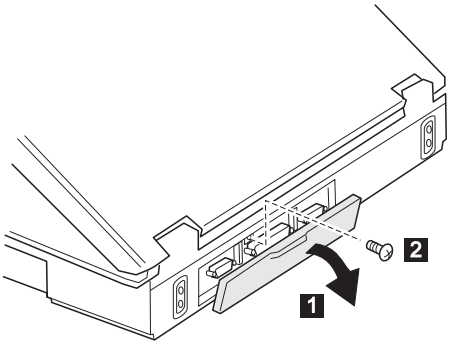
1060 Hard Disk Drive

Attention

Do not drop or apply any shock to the hard disk drive. The hard disk drive is sensitive to physical shock. Incorrect handling can cause damage and permanent loss of data on the hard disk. Before removing the hard disk drive, have the user make a backup copy of all the information on the hard disk. Never remove the hard disk drive while the system is operating or is in suspend mode.

Models 380, 380D, 385, and 385D

- Battery Pack **(1010)**
- Keyboard Unit **(1030)**
- CD-ROM/FDD Assembly **(1040)**



(Rear view)

Step	Size (Quantity)	Torque
2	M 2.5 x 6mm (1)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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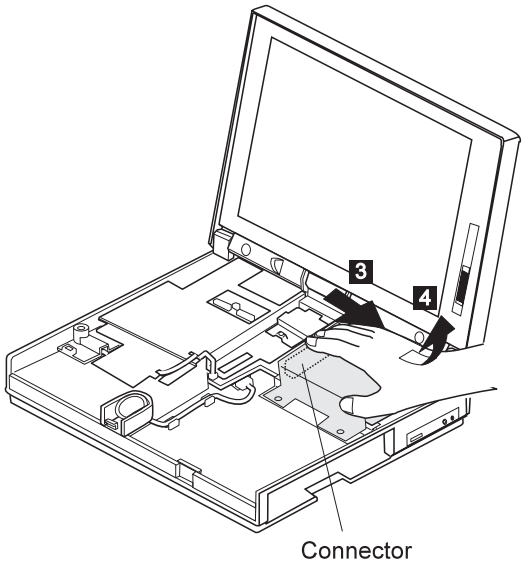

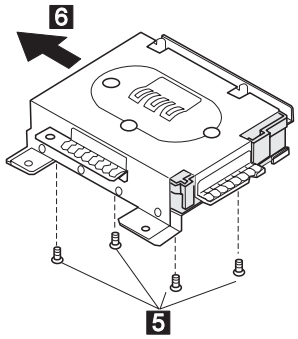

Step	Size (Quantity)	Torque
5	M 3 x 3mm (4)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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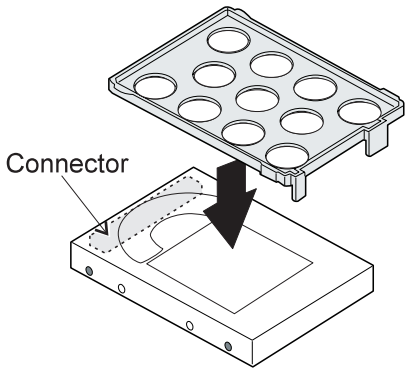
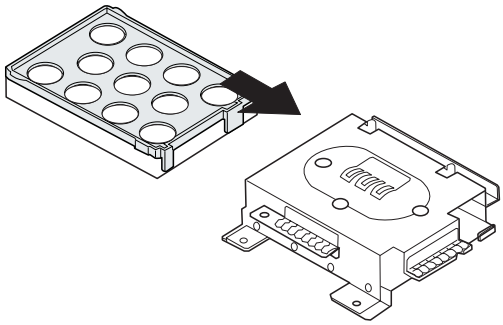
When replacing: When replacing the slim-type (12.5 mm) hard disk drive, assemble the spacer as follows:

1. Place the HDD spacer on the hard disk drive.

   Note: Make sure that the spacer is oriented properly.



2. Install the HDD-spacer assembly into the bracket; then screw.



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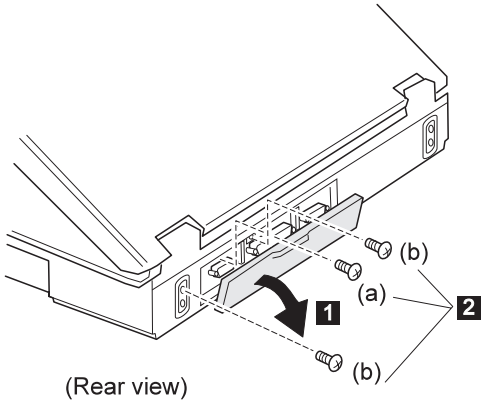
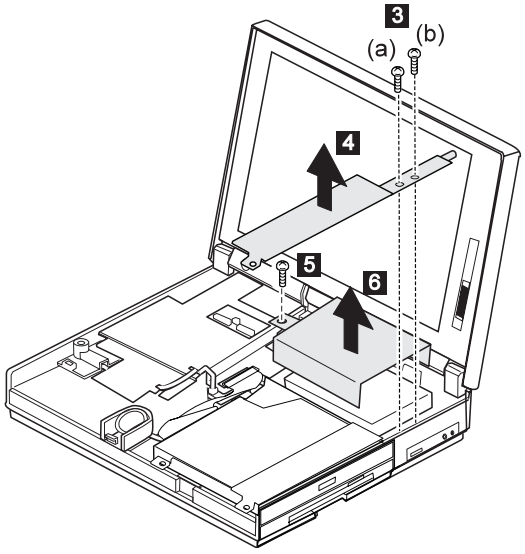
Model 380E, 380ED, 385E, and 385ED

- Battery Pack **(1010)**
- Keyboard Unit **(1030)**





Step	Size (Quantity)	Torque
2	**(a)** M 2.5 x 6mm, (1) **(b)** M 2.5 x 6mm, Nylon (2)	4 kgcm
3	M 2.5 x 6mm (3)	**(a)** 3 kgcm **(b)** 4 kgcm
5	M 2.5 x 6mm (1)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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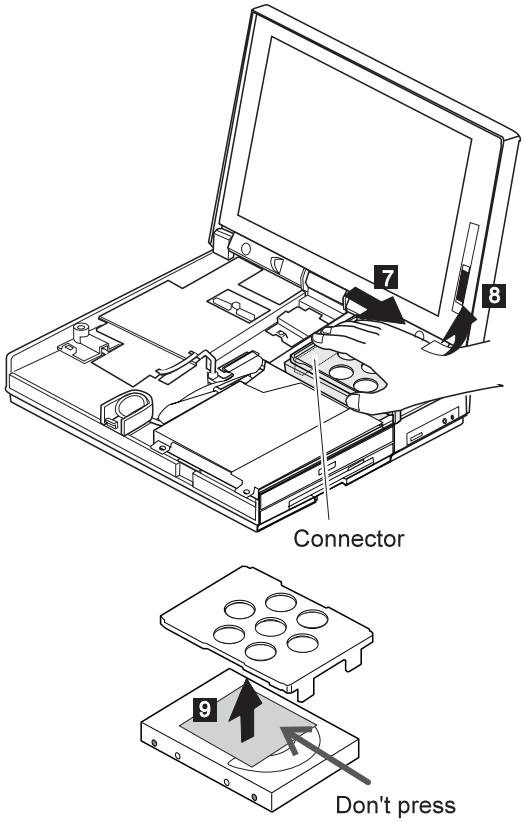
Note: Step 9 is for the slim-type (12.5 mm) hard disk drive only.



Attention

The hard disk drive is sensitive to physical shock. When removing or replacing it, do not press the shaded area of the hard disk drive.

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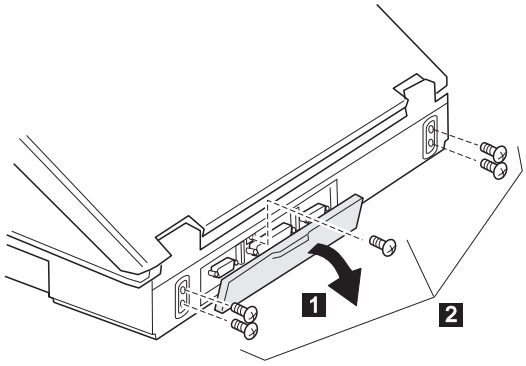
1070 LCD Unit

- Battery Pack **(1010)**
- Keyboard Unit **(1030)**



(Rear view)

Step	Size (Quantity)	Torque
2	M 2.5 x 6mm, Nylon (5)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

- Models 380, 380D, 385, and 385D, go to the next page.
- Models 380E, 380ED, 385E, and 385ED, go to “Models 380E, 380ED, 385E, and 385ED” on page 79.

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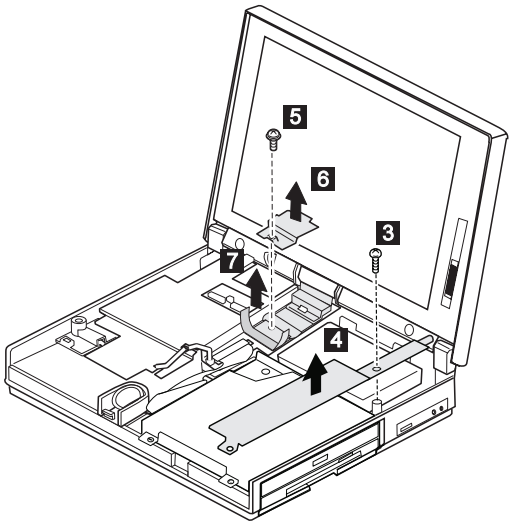
Models 380, 380D, 385, and 385D



Step	Size (Quantity)	Torque
3	M 2.5 x 6mm (1)	4 kgcm
5	M 2.5 x 6mm, Special head (1)	3 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

Go to “All Models” on page 80.

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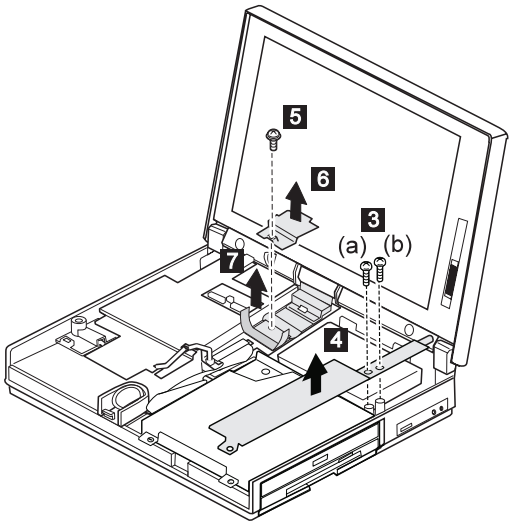
Models 380E, 380ED, 385E, and 385ED



Step	Size (Quantity)	Torque
3	M 2.5 x 6mm (2)	**(a)** 3 kgcm **(b)** 4 kgcm
5	M 2.5 x 6mm, Special head (1)	3 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

Go to “All Models” on page 80.

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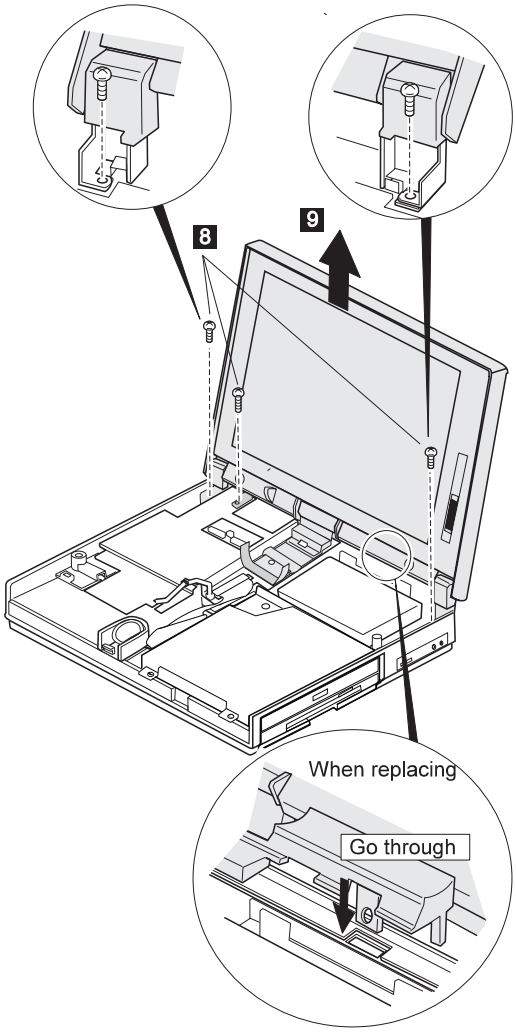
All Models



Step	Size (Quantity)	Torque
8	M 2.5 x 6mm (3)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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1080 System Board Assembly

Notes:

1. The system unit serial number must be restored when the system board is replaced. To restore the system unit serial number, select the option “Set system identification” on the maintenance diskette. The flash ROM on the system board contains the vital product data (VPD)—that is, the system unit serial number, system board system number, and other computer-unique data.
2. Do not power off the computer when restoring the VPD. The system unit serial number label is attached to the base cover.
3. Before removing and replacing the system board assembly, make sure that the PCMCIA cards are removed and the eject levers are not sticking out.

- Battery Pack **(1010)**
- DIMM Cover **(1020)**
- Keyboard Unit **(1030)**
- CD-ROM/FDD Assembly **(1040)**
- LCD Unit **(1070)**
- Hard Disk Drive **(1060)**

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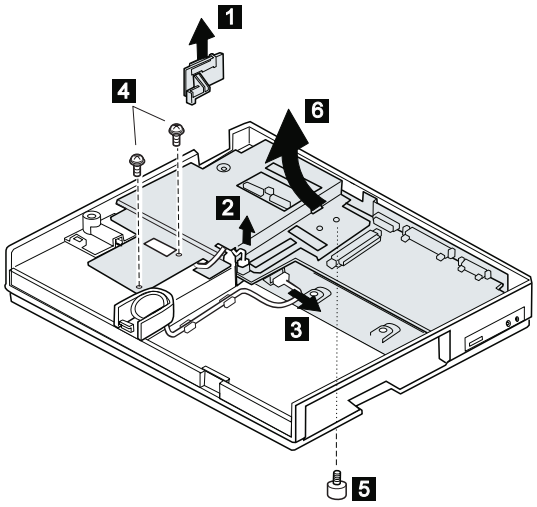
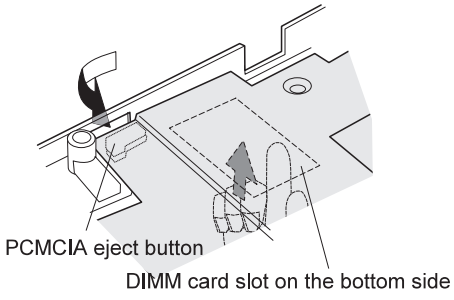


Note

As the PCMCIA eject buttons are sticking out, pull the buttons out slightly and fold them to the right; then push up the system board assembly from the bottom when removing the system board assembly.



Step	Size (Quantity)	Torque
4	M 2.5 x 6mm, Special head (2)	4 kgcm
5	Special screw (1)	3 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

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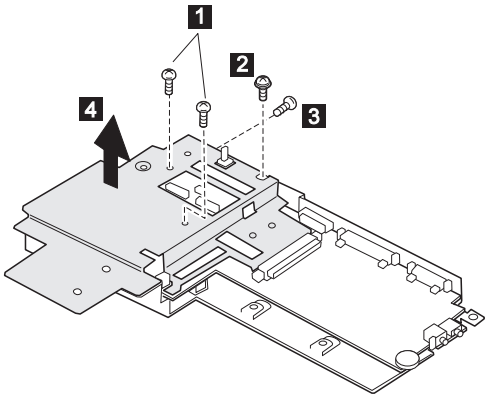
1090 Upper Shield Case

- Battery Pack **(1010)**
- DIMM Cover **(1020)**
- Keyboard Unit **(1030)**
- CD-ROM/FDD Assembly **(1040)**
- LCD Unit **(1070)**
- Hard Disk Drive **(1060)**
- System Board Assembly **(1080)**



Step	Size (Quantity)	Torque
1	M 2.5 x 6mm (2)	4 kgcm
2	M 2.5 x 6mm, Special head (1)	4 kgcm
3	M 2.5 x 8mm (1)	4 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

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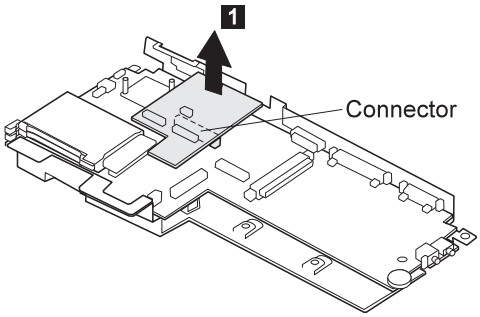
1100 Sub Card

- Battery Pack **(1010)**
- DIMM Cover **(1020)**
- Keyboard Unit **(1030)**
- CD-ROM/FDD Assembly **(1040)**
- LCD Unit **(1070)**
- Hard Disk Drive **(1060)**
- System Board Assembly **(1080)**
- Upper Shield Case **(1090)**



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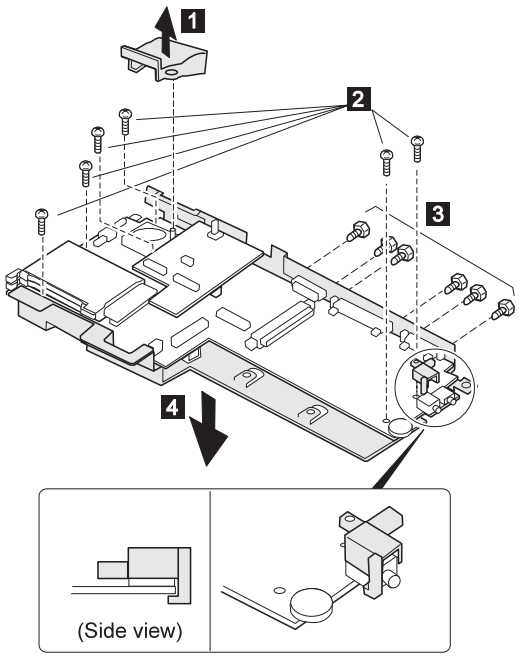
1110 Lower Shield Case

- Battery Pack **(1010)**
- DIMM Cover **(1020)**
- Keyboard Unit **(1030)**
- CD-ROM/FDD Assembly **(1040)**
- LCD Unit **(1070)**
- Hard Disk Drive **(1060)**
- System Board Assembly **(1080)**
- Upper Shield Case **(1090)**



Step	Size (Quantity)	Torque
2	M 2.5 x 6mm (6)	4 kgcm
3	Stud screw (6)	4 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

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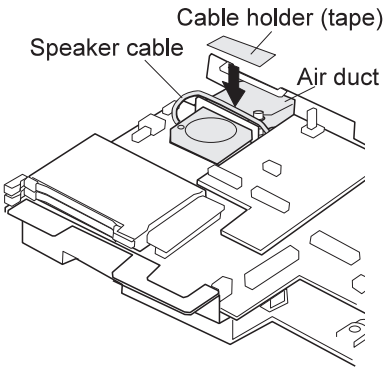
Cable Routing

When replacing the air duct, refer to the following artwork.



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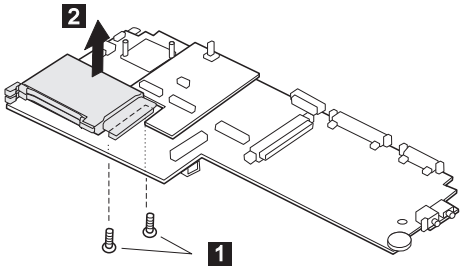
1120 PCMCIA Slot

- Battery Pack **(1010)**
- DIMM Cover **(1020)**
- Keyboard Unit **(1030)**
- CD-ROM/FDD Assembly **(1040)**
- LCD Unit **(1070)**
- Hard Disk Drive **(1060)**
- System Board Assembly **(1080)**
- Upper Shield Case **(1090)**
- Lower Shield Case **(1110)**



Step	Size (Quantity)	Torque
1	M 2 x 16mm (2)	2 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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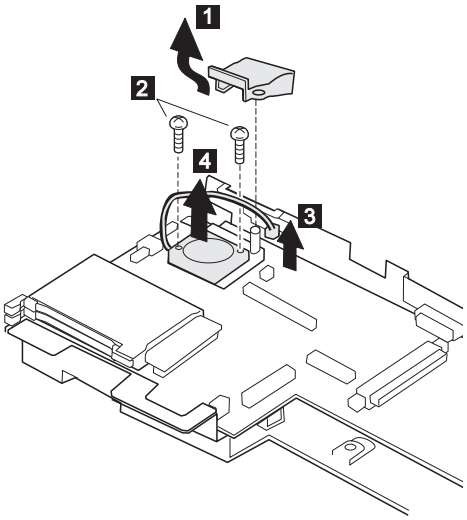
1130 Fan

- Battery Pack **(1010)**
- DIMM Cover **(1020)**
- Keyboard Unit **(1030)**
- CD-ROM/FDD Assembly **(1040)**
- LCD Unit **(1070)**
- Hard Disk Drive **(1060)**
- System Board Assembly **(1080)**
- Upper Shied Case **(1090)**
- Sub Card **(1100)**

Notes:

1. Be careful not to touch the rotor and blade of the fan when assembling or disassembling.
2. Fix the fan cable on the air duct by using the cable holder when replacing.



Step	Size (Quantity)	Torque
2	M 2 x 6mm (2)	2.5 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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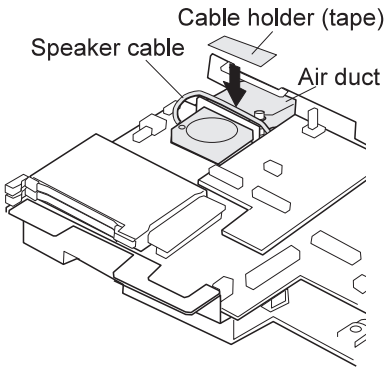
Cable Routing

When replacing the air duct, refer to the following artwork.



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2010 LCD Front Cover

- Battery Pack **(1010)**
- DIMM Cover **(1020)**
- Keyboard Unit **(1030)**
- CD-ROM/FDD Assembly **(1040)**
- LCD Unit **(1070)**

1 **2** **3** : LCD Front Cover
4 : Control Knob

Procedure continues on the following page.

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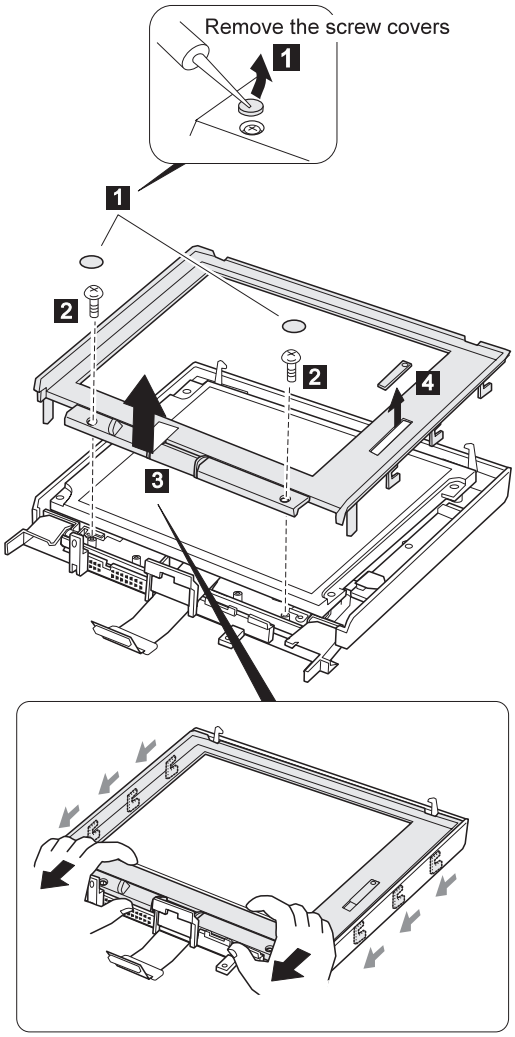
Notes:

1. The LCD front cover has several latches. Release the latches as shown in the figure in step 3 .
2. When replacing the control knob in step 4 , make sure that it works correctly.



Step	Size (Quantity)	Torque
2	M 2.5 x 6mm (2)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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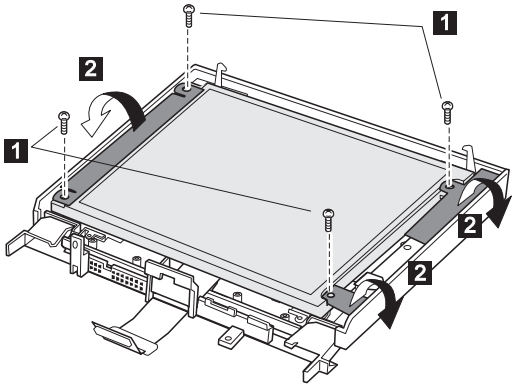
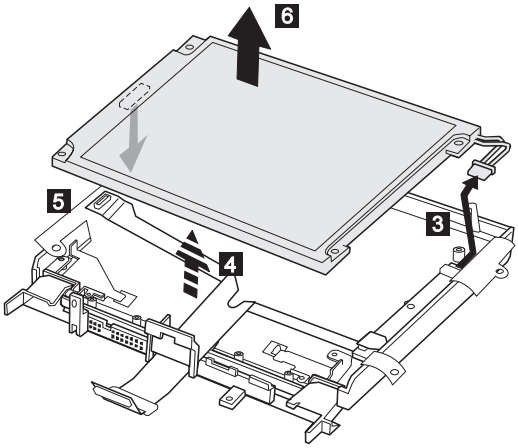
2020 LCD Panel

- Battery Pack **(1010)**
- DIMM Cover **(1020)**
- Keyboard Unit **(1030)**
- CD-ROM/FDD Assembly **(1040)**
- LCD Unit **(1070)**
- LCD Front Cover **(2010)**

DSTN LCD Panel



Note: In step 4, lift the LCD panel a little to disconnect the flexible cable in step 5.



Step	Size (Quantity)	Torque
1	M 2.5 x 6mm (4)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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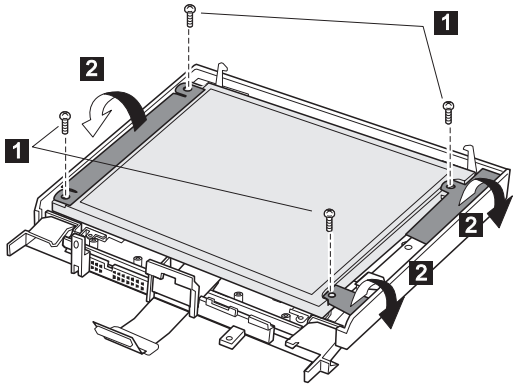
TFT LCD Panel



Step	Size (Quantity)	Torque
1	M 2.5 x 6mm (4)	4 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

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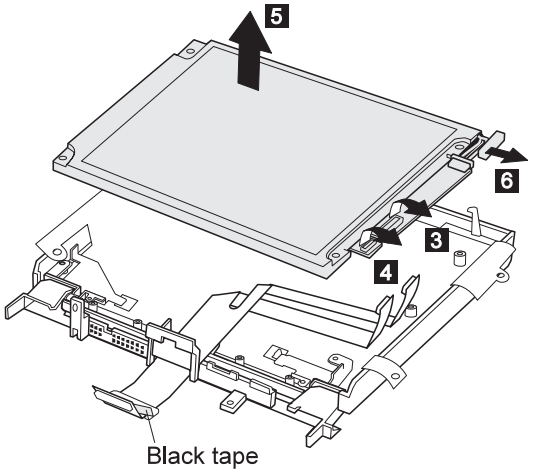
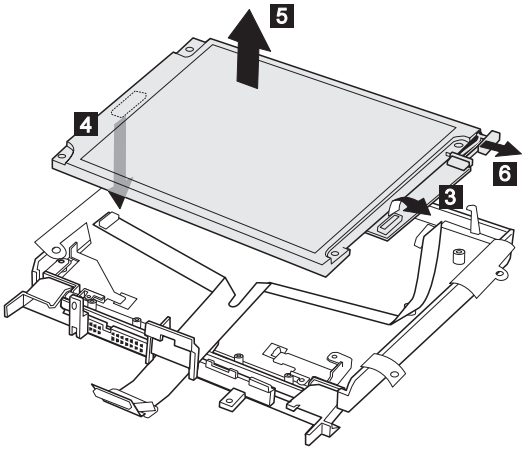
Type 1



Type 2



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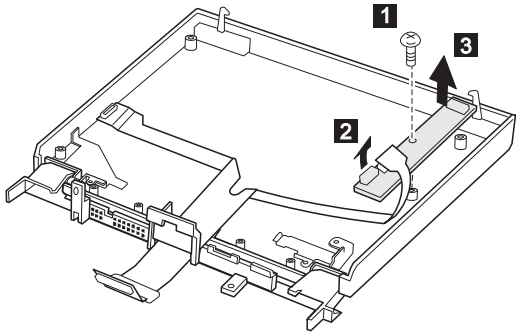
2030 LCD Inverter Card

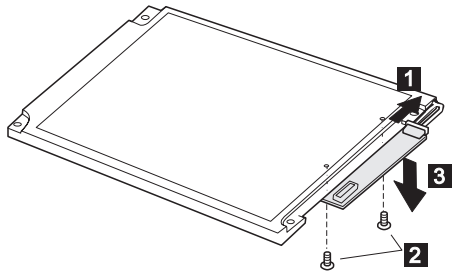
- Battery Pack **(1010)**
- DIMM Cover **(1020)**
- Keyboard Unit **(1030)**
- CD-ROM/FDD Assembly **(1040)**
- LCD Unit **(1070)**
- LCD Front Cover **(2010)**
- LCD Panel **(2020)**

DSTN LCD



Step	Size (Quantity)	Torque
1	M 2.5 x 6mm (1)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

TFT LCD (Type 2 only)



Step	Size (Quantity)	Torque
2	M 2.0 x 3.7mm (2)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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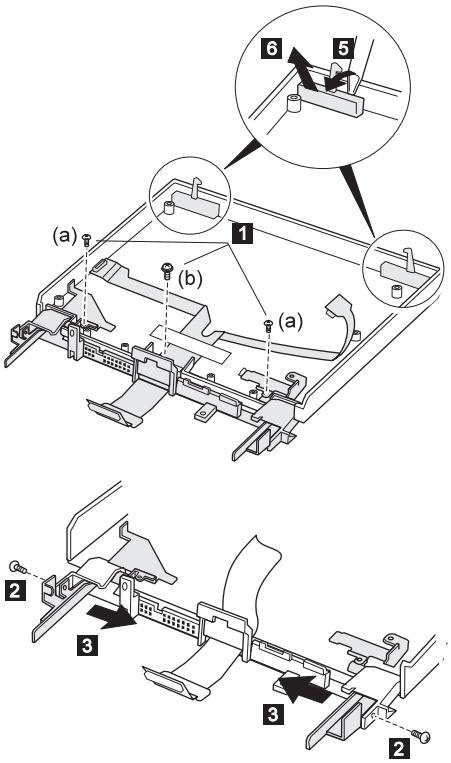
2040 LCD Misc. Parts

- Battery Pack **(1010)**
- DIMM Cover **(1020)**
- Keyboard Unit **(1030)**
- CD-ROM/FDD Assembly **(1040)**
- LCD Unit **(1070)**
- LCD Front Cover **(2010)**
- LCD Panel **(2020)**
- LCD Inverter Card **(2030)**

Hinges/Latches DSTN LCD

1 2 3 4 : Hinges
5 6 : Latches



Step	Size (Quantity)	Torque
1	**(a)** M 2.5 x 6mm (2) **(b)** M 2.5 x 6mm, Special head (1)	4 kgcm
2	M 2.5 x 6mm (2)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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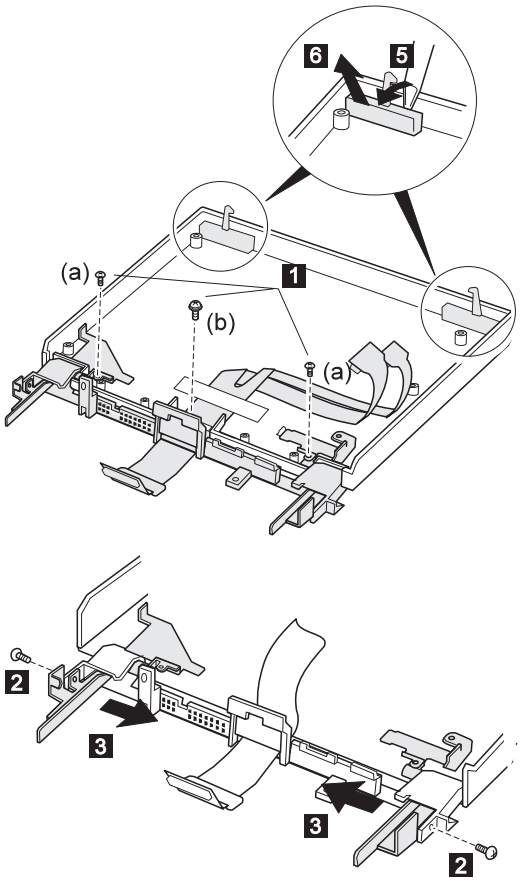
TFT LCD: This artwork shows the TFT type 1 LCD. For the type 2, do the same procedure.

1 2 3 4 : Hinges
5 6 : Latches



Step	Size (Quantity)	Torque
1	**(a)** M 2.5 x 6mm (2) **(b)** M 2.5 x 6mm, Special head (1)	4 kgcm
2	M 2.5 x 6mm (2)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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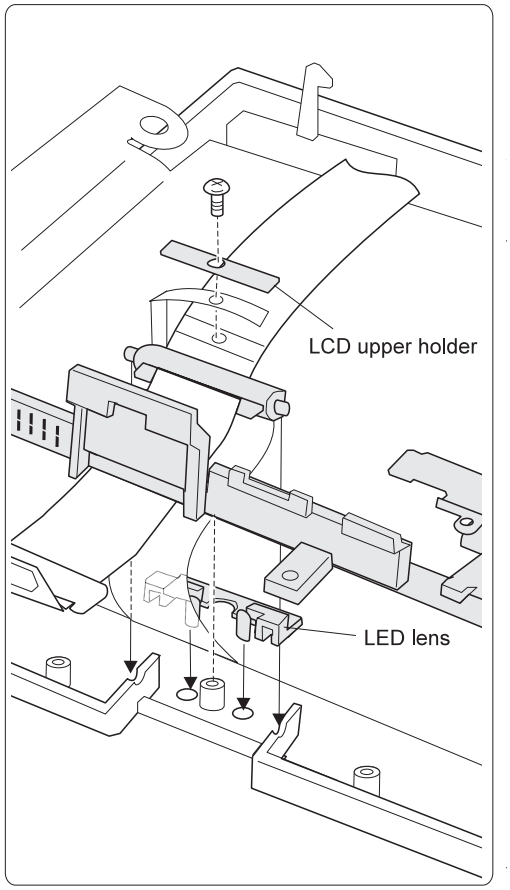
When replacing:

Replace the LCD miscellaneous parts as follows:



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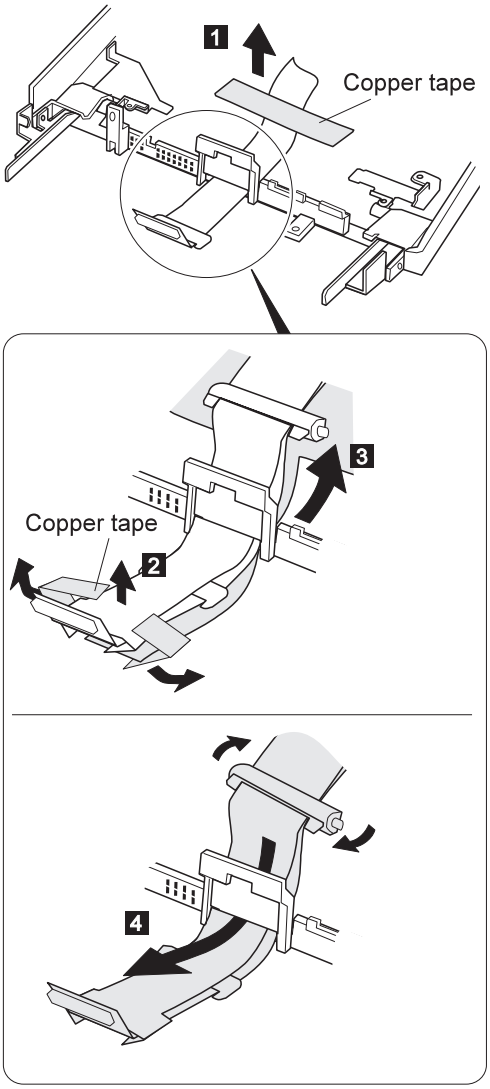
LCD Cable

DSTN LCD



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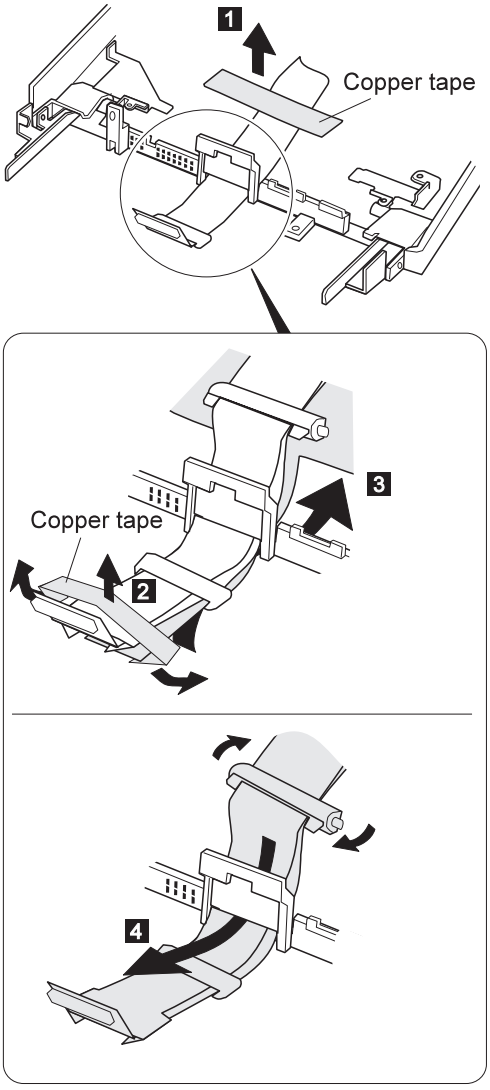
TFT LCD



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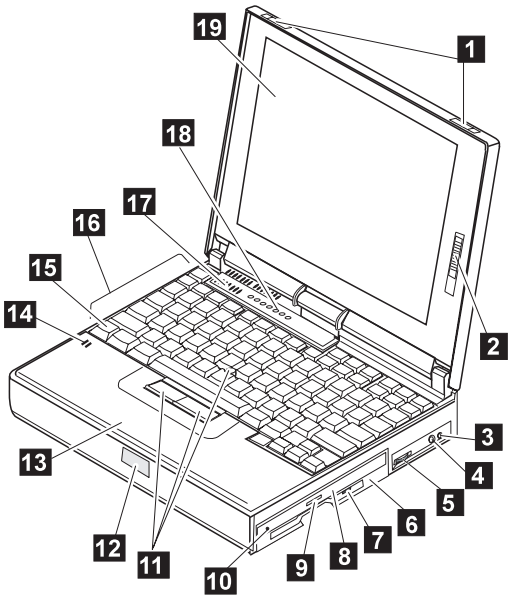
Locations

Front View

1 LCD latch
2 Contrast control (DSTN model)
Brightness control (TFT model)
3 Headphone jack
4 Microphone/line-in jack
5 Volume control
6 Diskette drive
7 Diskette eject button
8 CD-ROM drive
9 CD-ROM eject button
10 CD-ROM emergency eject hole
11 TrackPoint III
12 Built-in speaker
13 Palm rest
14 Built-in microphone
15 **Fn** Key
16 Keyboard
17 Fan louver
18 Status indicator
19 LCD panel



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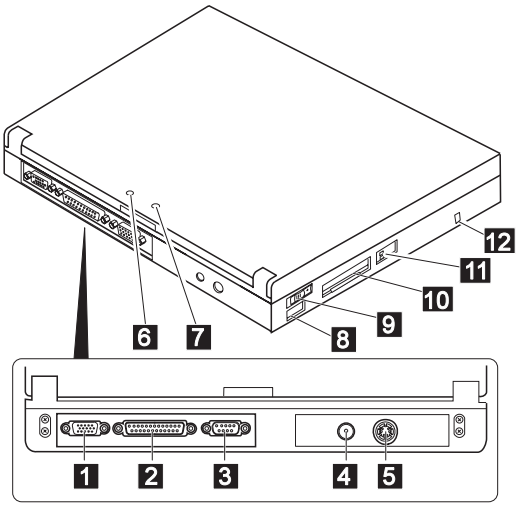
Rear View

1. External-monitor connector
2. Parallel connector
3. Serial connector
4. Power jack
5. External-input-device connector
6. Suspend mode indicator
7. Battery indicator
8. IR port
9. Power switch
10. PCMCIA slots
11. PC Card eject button
12. Security key hole



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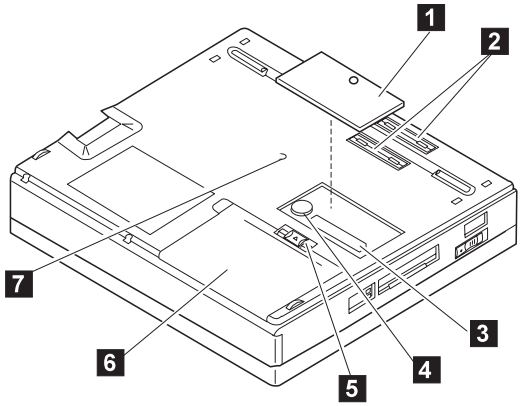
Bottom View

1. Memory-slot cover
2. System-expansion connector
3. Memory slot
4. Backup battery
5. Battery pack latch
6. Battery pack
7. Power shutdown switch



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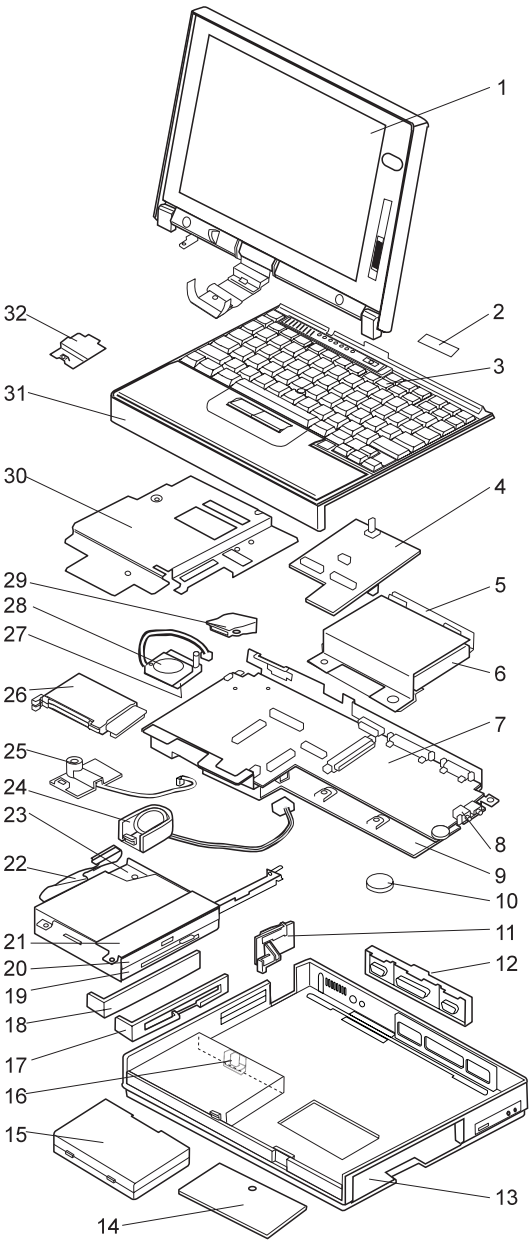
Parts Listing 380, 385 (2635)

Models 380/380D/385/385D



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Index	*System Unit*	
1	LCD Assembly	
	(see "Models 380/380D/385/385D" on page 108)	
2	Name Label Kit	05K4462
3	Keyboard Assembly *(see Keyboard Section)*	
4	Subcard	73H9928
5	HDD Bracket	73H9936
6	Hard Disk Drive (1.08 GB)	39H2221
	Hard Disk Drive (1.4 GB)	73H6419
	Hard Disk Drive (2.1 GB)	73H6427
7	System Board	
	For 380/380D/385/385D, 150MHz	83H6524
	For 380D/385D, 150MHz-MMX	73H9923
8	Audio Jack Holder *(see Misc. Parts)*	
9	Lower Shield Case	73H9927
10	Backup Battery	46H4132
11	Power Switch Knob *(see Misc. Parts)*	
12	I/O Door	05K4345
13	Base Cover Assembly	73H9919
14	DIMM Cover Assembly	73H9921
15	Battery Pack (Li-ion)	73H9951
	Battery Pack (NiMH)	73H9952
16	Battery Pack Latch Kit	11J8315
17	FDD Bezel	73H9932
18	Blank Bezel	73H9934
19	FDD	11J8338
20	8X CD-ROM	73H9933
21	Support Structure (see Misc. Parts)	
22	CD/FDD Connector (CD-Model)	73H9935
	FDD Connector (non CD-Model)	83H6527
23	Drive Bracket	73H9930
24	Speaker Assembly	73H9938
25	Microphone Assembly	73H9939
26	PC Card Slot	83H6523
27	Heat Sink (for fan)	83H6525
28	Fan	83H6526
29	Air Duct *(see Misc. Parts)*	
30	Upper Shield Case	73H9929
31	Keyboard Bezel	73H9950
32	LCD GND Holder, Lower *(see Misc. Parts)*	
	AC Adapter (35W)	
	2-pin	12J1442
	3-pin	12J1444
	Cable Holder (Tape)	11J8376
	Thermal Rubber	73H9924
	TrackPoint III Cap	84G6536

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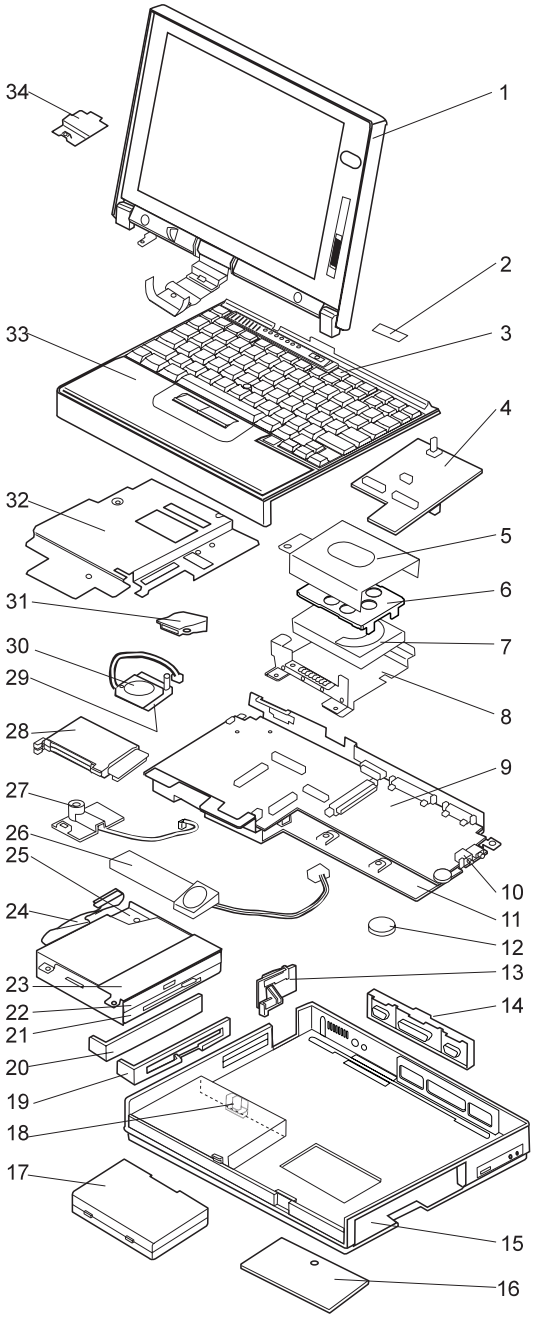
Models 380E/380ED/385E/385ED



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Index	System Unit	
1	LCD Assembly	
	(see "Models 380E/380ED/385E/385ED" on page 111)	
2	Name Label Kit	05K4462
3	Keyboard Assembly *(see Keyboard Section)*	
4	Subcard	73H9928
5	HDD Bracket, upper	12J0142
6	HDD Spacer	12J0143
	Note:	
	HDD spacer is for slim-type HDD (12.5mm).	
	Order either of the below hard disk drives	
	that match the FRU number of the drive being replaced.	
7	Hard Disk Drive (2.1 GB)	73H6427
7	Hard Disk Drive (2.1 GB)	12J4569
7	Hard Disk Drive (3 GB)	73H6430
7	Hard Disk Drive (3 GB)	83H7086
7	Hard Disk Drive (3 GB)	10L6074
7	Hard Disk Drive (5.1 GB)	83H7084
8	HDD Bracket, lower	12J0141
9	System Board	
	For 380E/385E, 150MHz-MMX	05K3115
	For 380ED/385ED, 166MHz-MMX	12J0146
10	Audio Jack Holder *(see Misc. Parts)*	
11	Lower Shield Case	12J0140
12	Backup Battery	46H4132
13	Power Switch Knob *(see Misc. Parts)*	
14	I/O Door	05K4345
15	Base Cover Assembly	73H9919
16	DIMM Cover Assembly	73H9921
17	Battery Pack (Li-ion)	73H9951
	Battery Pack (NiMH)	73H9952
18	Battery Pack Latch Kit	11J8315
19	FDD Bezel	73H9932
20	Blank Bezel	73H9934
21	FDD	11J8338
	Note:	
	Order either of the below CD-ROM drives	
	that match the FRU number of the drive being replaced.	
22	8-20x CD-ROM	12J0115
22	8-20x CD-ROM	02K0491
23	Support Structure (see Misc. Parts)	
24	CD/FDD Connector (CD-Model)	73H9935
	FDD Connector (non CD-Model)	83H6527
25	Drive Bracket	12J0144
26	Box Speaker Assembly	02K4311
27	Microphone Assembly	73H9939
28	PC Card Slot (**380E/385E**)	83H6523
	PC Card Slot (**380ED/385ED**)	05K4495
29	Heat Sink (for fan)	83H6525
30	Fan	83H6526
31	Air Duct *(see Misc. Parts)*	
32	Upper Shield Case	73H9929
33	Keyboard Bezel	73H9950
34	LCD GND Holder, Lower *(see Misc. Parts)*	
	AC Adapter (35W)	
	2-pin	12J1442
	3-pin	12J1444
	Cable Holder (Tape)	11J8376
	Thermal Rubber	73H9924
	TrackPoint III Cap	84G6536

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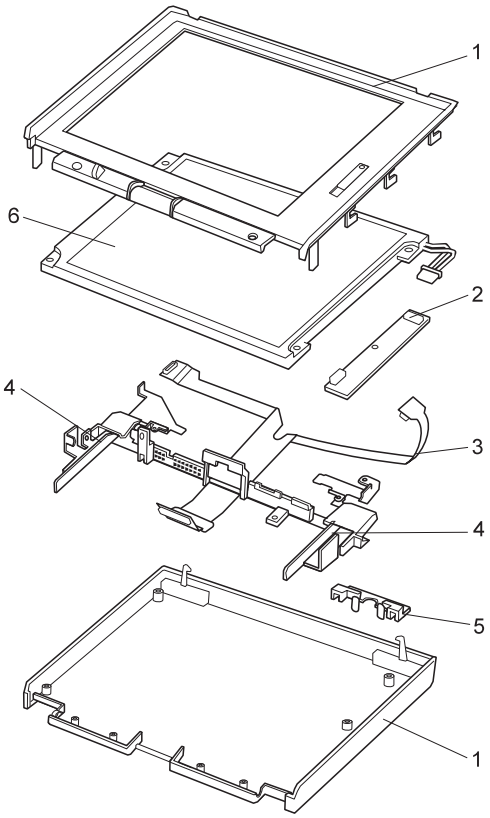
Models 380/380D/385/385D

LCD FRU (DSTN)



1	LCD Cover	73H9940
2	LCD Inverter	73H9946
3	LCD Cable	73H9947
4	LCD Hinge	73H9942
5	LCD Lens (*see Misc. Parts*)	
6	LCD Panel (12.1" DSTN)	73H9944
	LCD Misc. Parts	73H9949

Includes the following:
Control Knob
LCD Upper Holder
Latch, Right
Latch, Left
Latch, Spring (2)
Latch, Holder (2)
LED Lens
Screw Cap (2)
Cable Clamp (1)

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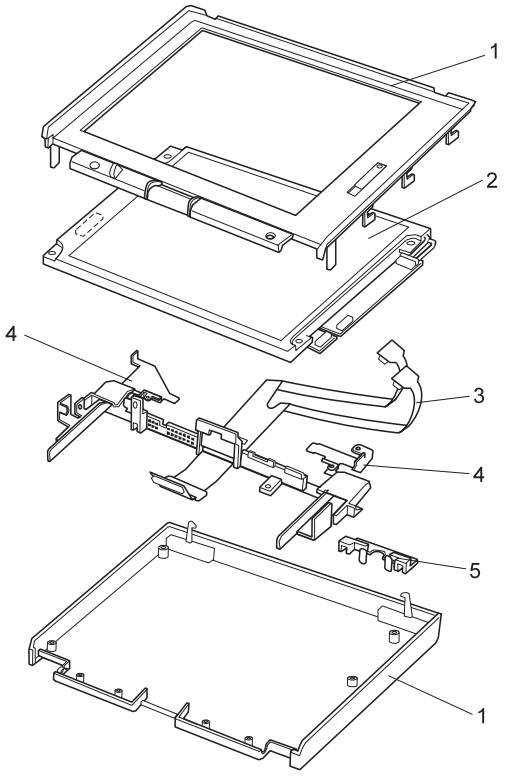
LCD FRU (TFT)

Type 1



1	LCD Cover	73H9941
2	LCD Panel (12.1" TFT)	05K9308
	LCD Inverter	05K3119
3	LCD Cable	73H9948
4	LCD Hinge	73H9943
5	LCD Lens (*see Misc. Parts*)	
	LCD Misc. Parts	73H9949
	Include the following:	
	Control Knob	
	LCD Upper Holder	
	Latch, Right	
	Latch, Left	
	Latch, Spring (2)	
	Latch, Holder (2)	
	LED Lens	
	Screw Cap (2)	
	Cable Clamp (1)	

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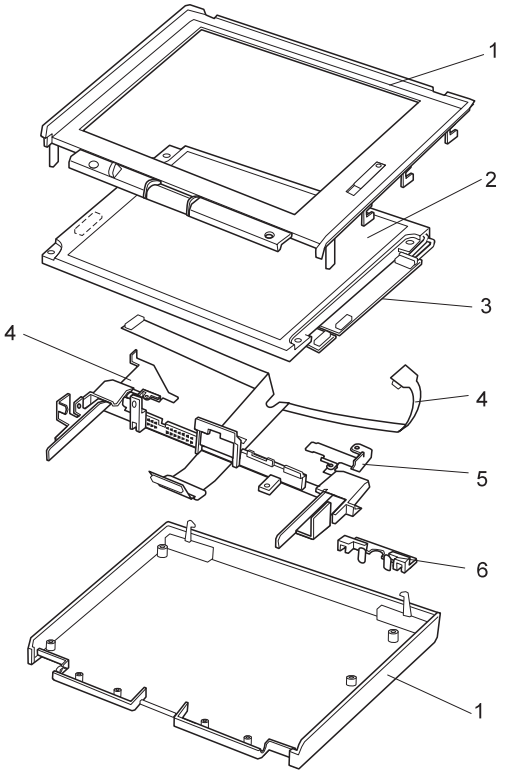
Type 2



1	LCD Cover	11J8860
2	LCD Panel (12.1" TFT)	11J9623
3	LCD Inverter	11J9622
4	LCD Cable	11J9625
5	LCD Hinge	73H9943
6	LCD Lens (*see Misc. Parts*)	

LCD Misc. Parts 73H9949
Includes the following:
Control Knob
LCD Upper Holder
Latch, Right
Latch, Left
Latch, Spring (2)
Latch, Holder (2)
LED Lens
Screw Cap (2)
Cable Clamp (1)

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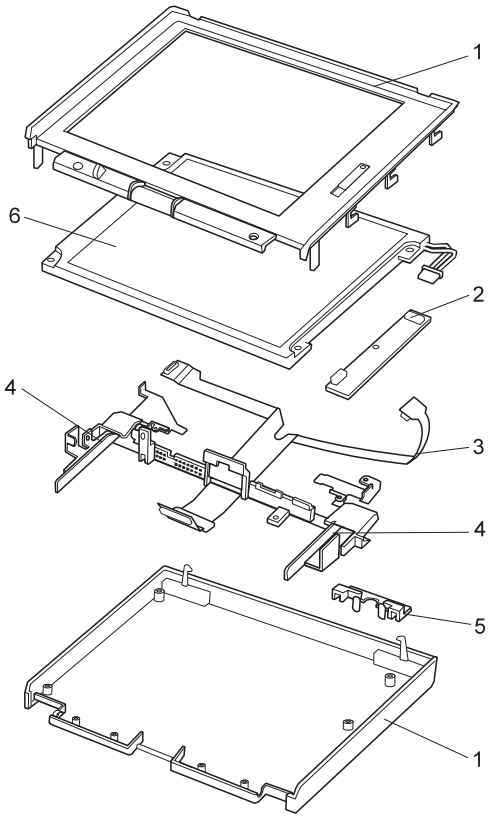
Models 380E/380ED/385E/385ED

LCD FRU (FRSTN)



1	LCD Cover	73H9940
2	LCD Inverter	73H9946
3	LCD Cable	12J0139
4	LCD Hinge	73H9942
5	LCD Lens (*see Misc. Parts*)	
6	LCD Panel (12.1" FRSTN)	12J0138
	LCD Misc. Parts	73H9949
	Includes the following:	
	Control Knob	
	LCD Upper Holder	
	Latch, Right	
	Latch, Left	
	Latch, Spring (2)	
	Latch, Holder (2)	
	LED Lens	
	Screw Cap (2)	
	Cable Clamp (1)	

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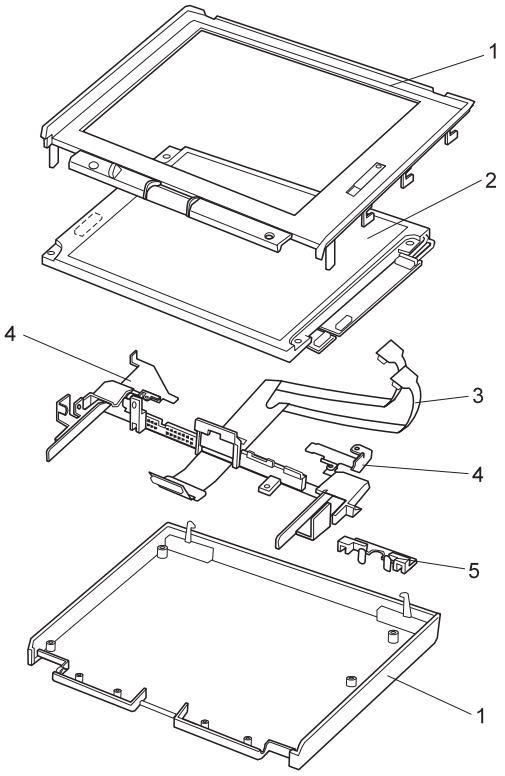
LCD FRU (TFT)

Type 1



1	LCD Cover	73H9941
2	LCD Panel (12.1" TFT)	05K9308
	LCD Inverter	05K3119
3	LCD Cable	73H9948
4	LCD Hinge	73H9943
5	LCD Lens (*see Misc. Parts*)	
	LCD Misc. Parts	73H9949
	Include the following:	
	Control Knob	
	LCD Upper Holder	
	Latch, Right	
	Latch, Left	
	Latch, Spring (2)	
	Latch, Holder (2)	
	LED Lens	
	Screw Cap (2)	
	Cable Clamp (1)	

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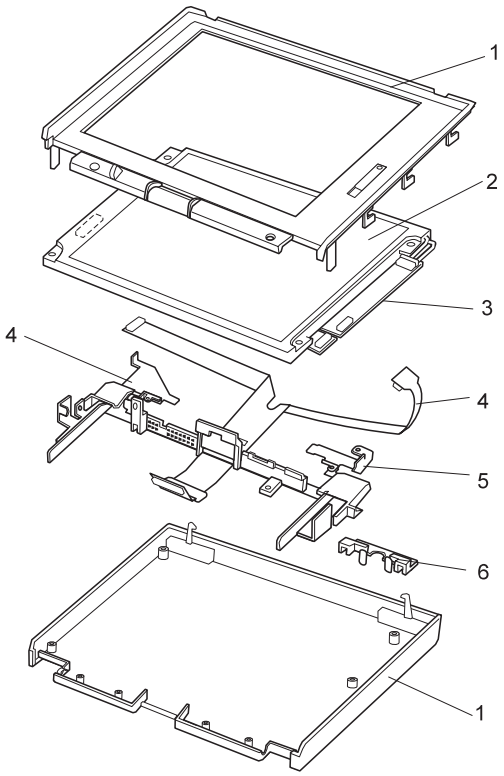
Type 2



1	LCD Cover	11J8860
2	LCD Panel (12.1" TFT)	11J9623
3	LCD Inverter	11J9622
4	LCD Cable	05K4358
5	LCD Hinge	73H9943
6	LCD Lens (*see Misc. Parts*)	
	LCD Misc. Parts	73H9949

Includes the following:
Control Knob
LCD Upper Holder
Latch, Right
Latch, Left
Latch, Spring (2)
Latch, Holder (2)
LED Lens
Screw Cap (2)
Cable Clamp (1)

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Keyboard

Arabic	11J8305
Belgian	83H6485
Canadian French	83H6488
Czech	11J8306
Danish	83H6487
Dutch	83H6480
French	83H6478
German	83H6477
Greek	11J8307
Hebrew	11J8308
Hungarian	11J8309
Italian	83H6479
Japanese	83H6476
Korean	11J8299
Latin Spanish	11J8302
Norwegian	83H6486
Poland	11J8311
Portuguese	11J8310
Russian	11J8300
Slovakian	11J8312
Slovenian	11J8313
Spanish	83H6482
Swedish / Finnish	83H6481
Swiss	83H6483
Turkish	11J8304
Taiwanese	11J8301
Thai	11J8303
U.K. English	83H6475
U.S. English	83H6474

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Common/Option Parts List

Miscellaneous Parts

Misc. Parts Include the following: Support structure Air Duct Audio Jack Holder Power Switch Knob LCD GNG Holder, Lower	12J0145
Screw Kits Include the following: Hex Stud, D-Sub (6) M2 x 2.4, Pan head (4) M2 x 1.8, Pan head (4) M2 x 6, Pan head (2) M2.5 x 3, Bind head (1) M2.5 x 6, Bind head (50) M2.5 x 6, flathead (1) M2.5 x 6, (Nylon) (9) M2.5 x 6, Bind head, with washer (2) M2.5 x 6, Big head (1) M2.5 x 8, Bind head (1) M2.5 x 8, (Nylon) (5) M2.5 x 25, (Nylon) (1) M2.5 Special head (6) M2.6 x 4, Bind head (1) M2.6 x 2.8, Bind head (3) M3 x 3, Bind head (4)	05K4313
Nylon Screw Kit Include the following: M2.5 x 25 (Nylon) (1000)	05K4316

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Options

Notes:

1. When you replace the AC Adapter, use the one for the country you are in even if the computer is from a different country.
2. The warranty for the system unit does not apply to all options.

380/385 Port Replicator	84G1320
8X CD-ROM	73H9933
AC Adapter (56W)	
2-pin	12J2585
3-pin	12J2583
Cover Set for 380/385 Port Replicator	84G1321
2.1 GB Hard Disk Drive Assembly	73H6427
3.2 GB Hard Disk Drive Assembly	83H7086
5.1 GB Hard Disk Drive Assembly	83H7084
Headset	85G1529
Interface Cable to System for Keyboard	84G2531
Interface Cable to Keyboard for Keypad	84G2532
Microphone	66G7871
Mini-DIN to Mini-DIN Cable.	84G6474
PS/2 Miniature Mouse	95F5723
SO-DIMM 8MB	42H2767
SO-DIMM 16MB	42H2768
SO-DIMM 32MB	42H2769
SO-DIMM 64MB	42H2817
ThinkPad 560 Port Replicator	46H4107

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Numeric Keypad

Belgian	95F5741
Canadian French	95F5466
Danish	95F5467
Dutch	95F5467
French	95F6313
German	95F6314
Greek	95F5467
Hebrew	95F5741
Icelandic	95F5467
Italian	95F6316
Japanese	79F6401
Norwegian	95F5467
Spanish	95F6315
Swedish / Finnish	95F5468
Swiss / French	95F5711
Swiss / German	95F5715
Turkish	95F5467
U.K. English	95F5741
U.S. English	95F5741

Black Keypad

French	84G6286
German	84G6280
Italian	84G6292
Swedish	84G6304
U.K. English	84G6298
Norwegian	84G6310
U.S. English	84G2530

Black Keyboard

French	84G6285
German	84G6279
Italian	84G6291
Swedish	84G6303
U.K. English	84G6297
Norwegian	84G6309
U.S. English	84G2529

Accessories

Keyboard/Mouse Cable	54G0444

Tools

Tri-Connector Wrap Plug	72X8546
PC Test Card	35G4703
Audio Wrap Cable	66G5180
Screwdriver Kit	95F3598
ThinkPad Hardware Maintenance Diskette Ver 1.40	06J0333

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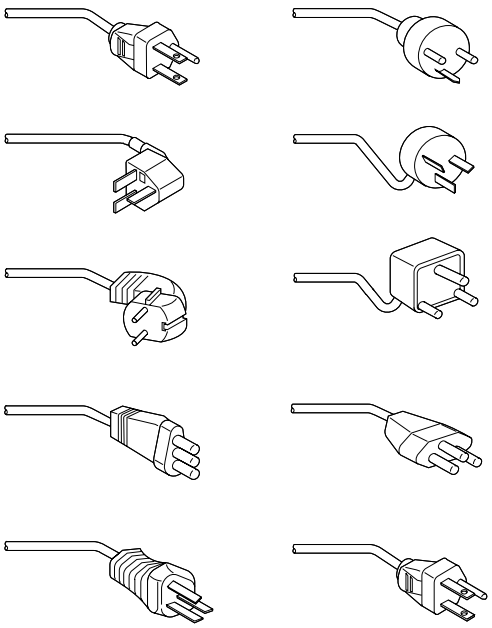
Power Cords



IBM power cords for a specific country are usually available only in that country:

- For 2-pin power cords:

IBM Power Cord Part Number	Used in These Countries
13H5264	Bahamas, Barbados, Bermuda, Bolivia, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Korea (South), Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Thailand, Trinidad (West Indies), United States of America, Venezuela
13H5267	Abu Dhabi, Albania, Antigua, Bahrain, Brunei, Dubai, Fiji, Hong Kong, India, Ireland, Kenya, Kuwait, Macao, Malaysia, Nigeria, Oman, People's Republic of China, Qatar, Singapore, United Kingdom

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IBM Power Cord Part Number	Used in These Countries
13H5270	Austria, Belgium, Bulgaria, Chile, Czech Republic, Denmark, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Israel, Italy, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Switzerland, Turkey, former Yugoslavia
13H5273	Japan
13H5276	Argentina, Australia, New Zealand, Papua New Guinea, Paraguay, Uruguay
13H5279	Bangladesh, Pakistan, South Africa, Sri Lanka

- For 3-pin power cords:

Note

The grounded adapter is required for full MPRII compliance.

IBM Power Cord Part Number	Used in These Countries
76H3514	Argentina, Australia, Papua New Guinea, New Zealand, Paraguay, Uruguay
76H3516	Bahamas, Barbados, Bermuda, Bolivia, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Trinidad (West Indies), Thailand United States of America, Venezuela
76H3518	Austria, Belgium, Bulgaria, Czech Republic, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Turkey, former Yugoslavia
76H3520	Denmark
76H3522	Bangladesh, Pakistan, South Africa, Sri Lanka

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IBM Power Cord Part Number	Used in These Countries
76H3524	Abu Dhabi, Albania, Antigua, Bahrain, Brunei, Dubai, Fiji, Hong Kong, India, Ireland, Kenya, Kuwait, Macao, Malaysia, Nigeria, Oman, People's Republic of China, Qatar, Singapore, United Kingdom
76H3526	Japan
76H3528	Switzerland, Liechtenstein
76H3530	Chile, Italy, Ethiopia, Libya
76H3532	Israel
76H3535	Korea

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Read This First

Before you go to the checkout guide, be sure to read this section.

Important Notes

- **Only certified trained personnel should service the computer**.
- Read FRU service procedures before replacing any FRUs.
- **Be extremely careful during such write operations as copying, saving, or formatting.** Drives in the computer that you are servicing might have been rearranged, or the drive startup sequence might have been altered. If you select an incorrect drive, data or programs can be written over.
- **Replace FRUs only for the correct model.** When you replace the FRU, make sure the model of the machine and FRU part number are correct by referring to the parts list.
- **FRUs should not be replaced because of a single, unreproducible failure.** Single failures can occur from a variety of reasons that have nothing to do with a hardware defect, such as: cosmic radiation, electrostatic discharge, or software errors. FRU replacement should be considered only when a recurring problem exists. If this is suspected, clear the error log and run the test again. Do not replace any FRUs if log errors do not reappear.
- **Be careful not to replace a nondefective FRU.**

How to Use Error Messages: Use the error codes displayed on the screen to diagnose failures. If more than one error code is displayed, begin the diagnosis with the first error code. The cause of the first error code can result in false error codes being displayed. If no error code is displayed, see if the error symptom is listed in the "Symptom-to-FRU Index" on page 138.

Port Replicator Problems: If you suspect a problem with the Port Replicator, see "Port Replicator Checkout" on page 134.

How to Diagnose Multiple FRUs: When the adapter or device has more than one FRU, the error code could be caused by either FRU. Before replacing multiple FRUs, try removing or exchanging each FRU, one by one in the designated sequence, to see if the symptoms change.

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What to Do First: The servicer must include the following in the parts exchange form or parts return form that is attached to the returned FRU.

___ 1. Name and phone number of servicer
___ 2. Date of service
___ 3. Date when part failed
___ 4. Date of purchase
___ 5. Failure symptoms, error codes appearing on display, and beep symptoms
___ 6. Procedure index and page number in which the failing FRU was detected
___ 7. Failing FRU name and part number
___ 8. Machine type, model number, and serial number
___ 9. Customer's name and address

Before checking problems with the computer, determine whether the damage is covered under the warranty by referring to the following:

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Warranty Notes

During the warranty period, the customer may be responsible for repair costs if the computer damage was caused by misuse, accident, modification, unsuitable physical or operating environment, or improper maintenance by the customer.

The following is not covered under warranty:

- LCD panel cracked from the application of excessive force or from being dropped
- Scratched (cosmetic) parts
- Cracked or broken plastic parts, broken latches, broken pins, or broken connectors caused by excessive force
- Damage caused by liquid spilled into the system
- Damage caused by the improperly insertion of a PCMCIA Card or the installation of an incompatible card
- Damage caused by foreign material in the FDD
- Diskette drive damage caused by the diskette drive cover being pressed or by the insertion of diskettes with multiple labels
- Damaged or bent diskette eject button
- Fuses blown by attachment of a nonsupported device
- Forgotten computer password (making the computer unusable)

If the following symptoms are present, they may indicate damage caused by nonwarranted activity:

- Missing parts might be a symptom of unauthorized service or modification.
- HDD spindles can become noisy from being subjected to excessive force or from being dropped.
- I9990303 errors can be caused by exposure to strong magnetic fields.

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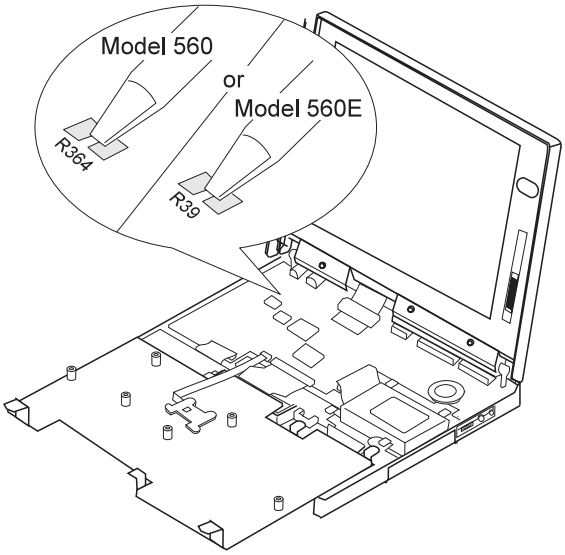
How to Disable the Power-On Password

1. Power off the computer.
2. Remove the frame (see “1040 Frame” on page 160).
3. Flip the keyboard over as shown in the figure.
4. Jumper the two password jumper pads (either R364 or R39) on the system board.



5. Power on the computer to clear the password.
6. Replace the keyboard and the frame.

   Note: When replacing the frame, make sure the frame fits correctly. If it is not in place, the click buttons of the TrackPoint III cannot be pressed. (See the note in “1050 Keyboard Unit” on page 163.)

7. Replace the screws.
8. Power on the computer and wait until the POST ends.
9. Verify that the password prompt does not appear.

To reactivate the password, set the password again.

Power Shutdown Switch: The power shutdown switch resets the system regardless of the microcode status and forces the power off. Use this push button to power off when power is not completely off or the microcode is in a hung state. See “Bottom View” on page 184 for the power shutdown switch.

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Checkout Guide

Use the following procedure as a guide for computer problems.

Note: The diagnostic tests are intended to test only IBM products. Non-IBM products, prototype cards, or modified options can give false errors and invalid system responses.

1. Obtain the failing symptoms in as much detail as possible.
2. Verify the symptoms by attempting to re-create the failure by running the diagnostic test or by repeating the same operation.

   Note: To run the diagnostics, refer to "Running the Diagnostics" on page 151.

3. Use the following table with the verified symptom to determine which page to go to. Search the symptoms column, and find the description that best matches your symptom; then go to the page shown in the "Go To" column.

Symptoms (Verified)	Go To
Power failure. (The power indicator does not go on or stay on.)	"Power Systems Checkout" on page 131.
POST does not complete. No beeps or error codes are indicated.	"Symptom-to-FRU Index" on page 138, and then use the **No Beep Symptoms** table.
POST beeps, but no error codes are displayed.	"Symptom-to-FRU Index" on page 138, and then use the **Beep Symptoms** table.
POST detected an error and displayed numeric error codes.	"Symptom-to-FRU Index" on page 138, and then use the **Numeric Error Codes** table.
The diagnostic test detected an error and displayed a FRU code.	"Running the Diagnostics" on page 151.
The configuration is not the same as the installed devices.	"Checking the Installed Devices List" on page 152.
Other symptoms (such as LCD display problems).	"Symptom-to-FRU Index" on page 138, and then use the **Other Symptoms** table.
Symptoms cannot be re-created. (Intermittent problems.)	Use the customer-reported symptoms and go to "Symptom-to-FRU Index" on page 138.

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Memory Checkout

DIMM cards are available for increasing memory capacity. The following figure indicates the displayed memory values.

DIMM	560	560E
No DIMM installed	7808KB	16000KB
8MB	16000KB	24192KB
16MB	24192KB	32384KB
32MB	40576KB	48768KB
64MB	—	81536KB

Memory errors might stop system operations, show error messages on the screen, or hang the system.

Use the following procedure to isolate memory problems.

Note: Make sure that the DIMM is fully installed into the connector. A loose connection can cause an error.

1. Power off the computer and remove the DIMM from its slot (if installed).
2. Press and hold the **F1** key; then power on the computer. Hold the **F1** key down until the Easy-Setup screen appears.
3. Select **Test** and press **Enter**.
4. Select **Memory** and press **Enter** to run the memory test on base memory. If an error appears, replace the system board.
5. Power off the computer and reinstall the DIMM; then power on the computer. Verify the memory size; then test the memory. If an error appears, replace the DIMM.

If memory problems occur intermittently, use the loop option to repeat the test. When the test detects an error, an error log is printed on the printer connected to the parallel port. See “Displaying the Error Log” on page 152 for more information.

System Programs in Flash Memory: System setup programs and diagnostic tests are stored in flash memory.

Flash Memory Update: A flash memory update is required for the following conditions:

- New versions of system programs
- New features or options are added

To update the flash memory, do the following:

1. Get the appropriate diskette containing the update.
2. Insert the **System Program Service Diskette** into drive A and power on the computer.

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3. Select **Update system programs** from the menu.

System Board Checkout

The processing functions are performed by the system board. When a numeric code calls the system board as a FRU, use the following procedure to isolate the problem:

1. Run the system board test to verify the symptom. This test verifies the system board. If no error is detected, return to “Checkout Guide” on page 127.
2. If FRU code 10 appears, replace the system board.
3. Rerun the test to verify the fix.

If this procedure does not correct the problem, go to “Undetermined Problems” on page 149.

Keyboard or Auxiliary Input Device Checkout

Remove the external keyboard if the internal keyboard is to be tested.

If the internal keyboard does not work or an unexpected character appears, make sure that the flexible cable extending from the keyboard is correctly seated in the connector on the system board.

If the keyboard cable connection is correct, run the **Keyboard Test** by doing the following:

1. Go to the diagnostic menu screen by pressing **Ctrl**+**A** in the Easy-Setup screen.
2. Press **Ctrl**+**K**; a layout of the keyboard appears on the screen.
3. Check that when each key is pressed, the key's position on the keyboard layout on the screen changes to a black square.

   Note: When the **Fn** key is pressed, a black square briefly appears.

If the tests detect a keyboard problem, do the following one at a time to correct the problem. Do not replace a nondefective FRU.

- Reseat the keyboard cable.
- Replace the keyboard.
- Replace the system board.

The following auxiliary input devices are supported for this computer:

- Numeric keypad
- Mouse (PS/2 compatible)
- External keyboard (with keyboard/mouse cable)

If any of the these devices do not work, reseat the cable connector and repeat the failing operation.

If the problem does not recur, recheck the connector.

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If the problem is not corrected, replace the device and then the system board.

TrackPoint III Checkout

If the TrackPoint III does not work, check the configuration in the ThinkPad Features program. If the configuration of the TrackPoint III is disabled, select **Enable** to enable it.

If this does not correct the TrackPoint III problem, continue with the following.

The TrackPoint III does automatic compensations to adjust the pointer sensor. During this process, the pointer moves on the screen automatically for a short time. This self-acting pointer movement can occur when a slight, steady pressure is applied to the TrackPoint III pointer while the computer is powered on or while the system is running, or when readjustment is required because the temperature has exceeded its normal temperature range. This symptom does not indicate a hardware problem. No service actions are necessary if the pointer movement stops in a short period of time.

If a click button problem or pointing stick problem occurs, do the following:

1. Go to the Easy-Setup screen.
2. Select an item with the pointing stick.
3. Press either the left or right click button.
4. Verify that both buttons work correctly.

If either the pointing stick or the click button do not work, do the following actions one at a time to correct the problem. Do not replace a nondefective FRU.

- Reseat the keyboard cables.
- Replace the keyboard.
- Replace the system board.

Diskette Drive Checkout

Do the following to isolate the problem to a controller, drive, or diskette. A scratch, write-enabled, nondefective 2HD diskette is required.

FDD-1 represents an external diskette drive attached through the external diskette drive connector. *FDD-2* represents the port replicator.

Warning: Make sure that the diskette does not have more than one label attached to it. Multiple labels can cause damage to the drive or cause the drive to fail.

Do the following to select the test device:

1. Go to the advanced diagnostic mode by pressing **Ctrl**+**A** from the diagnostic menu.
2. Select **Tool**; then select the **FDD-1** or **FDD-2** icon and press the spacebar. A √ mark appears next to the selected icon.

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3. Press **Enter.**
4. Insert the **blank** diskette when instructed.
5. Type **Y** (Yes) to the question on the screen.
6. Select **FDD-1** or **FDD-2** and press **Enter** to run the diskette drive test.
7. If the controller test detects an error, FRU code 10 appears. Replace the system board.
8. If the controller test runs without errors, the drive read/write tests start automatically.
9. If the drive test detects an error, FRU code 50 for FDD-1 or 51 for FDD-2 appears. If the diskette itself is known to be good, replace the drive.
10. If FDD-2 test detects an error, move the drive to the computer's diskette drive connector directly, if possible, and test it again as FDD-1.

    If no errors occur in the FDD-1 position, the drive is not defective. Go to “Port Replicator Checkout” on page 134 to isolate the replicator problem.

Status Indicator Checkout

If an LED problem occurs, do the following:

1. Power off the computer.
2. Power on the computer.
3. All the LEDs in the indicator panel should turn on for a moment soon after the computer is powered on. Make sure they turn on.

   If the problems remains, replace the system board.

Power Systems Checkout

To verify the symptom of the problem, power on the computer using each of the following power sources.

1. Remove the battery pack and diskette drive.
2. Connect the AC Adapter and check that power is supplied.
3. Disconnect the AC Adapter and install the charged battery pack; then check that power is supplied by the battery pack.

If you suspect a power problem, see the appropriate power supply check in the following list:

- “Checking the AC Adapter”
- “Checking Operational Charging” on page 132
- “Checking the Battery Pack” on page 133
- “Checking the Backup Battery” on page 134

Checking the AC Adapter:

You are here because the computer fails only when the AC Adapter is used.

- If the power problem occurs only when the port replicator is used, replace the replicator.

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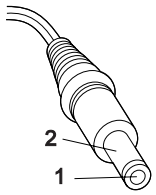
- If the power-on indicator does not turn on, check the power cord of the AC Adapter for correct continuity and installation.
- If the operational charge does not work, go to "Checking Operational Charging."

1. Unplug the AC Adapter cable from the computer and measure the output voltage at the plug of the AC Adapter cable. See the following figure.



(16 - 10 V)

Pin	Voltage (V dc)
1	+14.5 to +17.0
2	Ground

   - Replace the DC/DC card.
   - Replace the system board.
   - If the problem is not corrected, go to "Undetermined Problems" on page 149.
   - If the voltage is not correct, go to the next step.
2. Unplug the AC Adapter cable from the ac power outlet and wait 5 minutes or longer to allow the over-voltage protection circuit to be fully discharged and initialized.
3. Plug the AC Adapter cable into the ac power outlet.
4. Measure the output voltage of the AC Adapter.
5. If the voltage is still not correct, replace the AC Adapter.

Note: An audible noise from the AC Adapter does not always indicate a defect.

Checking Operational Charging: To check operational charging, use a discharged battery pack or a battery pack that has less than 50% of the total power remaining when installed in the computer.

Perform operational charging. If the battery status indicator does not turn on, remove the battery pack and let it return to room temperature. Reinstall the battery pack. If the charge indicator still does not turn on, replace the battery pack.

If the charge indicator still does not turn on, replace the DC/DC card. Then reinstall the battery pack. If the reinstalled battery pack is not charged, go to the next section.

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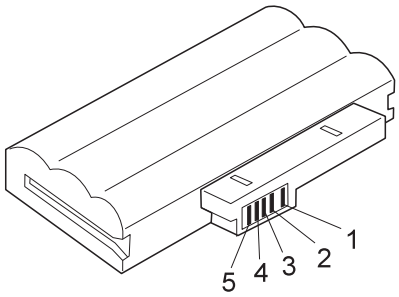
Checking the Battery Pack: Battery charging will not start until the Fuel-Gauge shows that less than 95% of the total power remains; with this condition the battery pack will charge to 100% of its capacity. This protects the battery pack from being overcharged or having a shortened life.

Do the following:

1. Power off the computer.
2. Remove the battery pack and measure the voltage between battery terminals 1 (+) and 4 (–). See the following figure:



Terminal	Voltage (V dc) / Signal
1	**+0 to +13.5**
2	Send
3	**Thermal**
4	**Ground (–)**
5	Select

Note: Signal lines, not used in these steps, are used for communication between the system and the battery.

3. If the voltage is less than +11.0 V dc, the battery pack has been discharged. Recharge the battery pack.

   Note: In this case, the battery pack is over-discharged. It takes at least 2 hours to recharge the battery pack even if the indicator does not turn on.

   If the voltage is still less than +11.0 V dc after recharging, replace the battery.

   Note: If the voltage of the battery pack is 0 V, it is not defective.

4. If the voltage is more than +11.0 V dc, measure the resistance between battery terminals 3 and 4. The resistance must be 4 to 30 K ohm.

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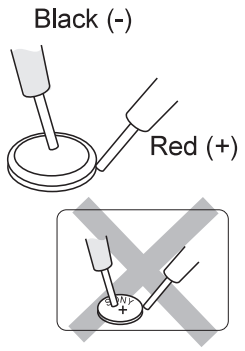
If the resistance is not correct, replace the battery pack. If the resistance is correct, replace the DC/DC card. If the problem persists, replace the system board.

Checking the Backup Battery

1. Power off the computer and unplug the AC Adapter from the computer.
2. Turn the computer upside down.
3. Remove the DIMM cover and backup battery (see “1010 Backup Battery” on page 157).
4. Measure the voltage of the backup battery. See the following figure.

   Note: Be careful not to measure the wrong side of the backup battery.



Wire	Voltage (V dc)
Red	+2.5 to +3.7
Black	Ground

- If the voltage is correct, replace the system board.
- If the voltage is not correct, the backup battery has been discharged. Replace the backup battery.
- If the backup battery discharges quickly after replacement, replace the system board.

Port Replicator Checkout

Use the following procedure to isolate a port replicator problem. A port replicator attaches to the system expansion connector at the bottom of the computer.

1. Power off the computer.
2. Remove the failing devices from the replicator.
3. Unplug the AC adapter from the replicator, if attached.
4. Remove the port replicator from the computer.
5. Reconnect the failing device directly to the computer. (If another device is already connected to the computer, remove it first.)

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6. Go to the “Running the Diagnostics” on page 151 and run the diagnostics.
7. If the advanced diagnostic device test does not find an error, suspect a problem with the port replicator of the system expansion bus.
8. Power off the computer and reconnect the port replicator.
9. Power on the computer and run the following advanced diagnostic tests:
   - Serial port test with the wrap plug installed on the replicator
   - Parallel port test with the wrap plug installed on the replicator
   - FDD-2 device test on the failing device with scratch diskette
10. If diagnostic errors appear, replace the replicator or diskette drive attachment unit.
    If the problem remains after the replacement, replace the system board.
11. If power problems appear only when the replicator is used, replace the replicator.

Power Management Features

Three power management modes are provided by the computer to reduce power consumption and prolong battery power.

Standby Mode: In standby mode the following occurs:

- The LCD backlight turns off.
- The hard disk motor stops.

Events that cause the computer to enter standby mode:

- Standby is requested by the **Fn** key. (**Fn**+**F3**)
- There has been activity under **auto-standby** in the ThinkPad Features program.

The computer exits standby and resumes operation when any key is pressed.

Suspend Mode: In suspend mode, the following occurs, in addition to what occurs in standby mode:

- The LCD is powered off.
- The hard disk is powered off.
- The CPU stops.

Events that cause the computer to enter suspend mode:

- Suspend mode is requested by the **Fn** key (**Fn**+**F4**).
- The LCD is closed.
- The specified time has elapsed from the last operation with the keyboard, mouse, hard disk drive, parallel connector, or diskette drive; or the AC Adapter is plugged in. The time is specified by ***Suspend Timer*** in the ThinkPad Features program.

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- The battery condition is low. The battery power indicator blinks orange.
- Either the PS2 OFF or PS2 SUSpend command is set in the ThinkPad Features program.

Notes

Notes:

1. In the ThinkPad Features program, the computer can be set to “Will not suspend even if LCD is closed”.
2. When the computer is powered with ac power and is used with one of the communication PC Cards, the computer enters *standby mode*; the PC Card and application program remain active.
3. The computer cannot enter suspend mode while a communication link is running.

Events that cause the computer to resume operation:

- The LCD is opened.
- The real time clock alarm is signaled.
- The ring indicator (RI) is activated.
- The **Fn** key is pressed.
- (Resume) An external keyboard key is pressed while the computer is operating with ac power.

The computer also exits suspend mode when timer conditions are satisfied for entering hibernation mode.

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Hibernation Mode: In hibernation mode, the following occurs:

- The system status, RAM, VRAM, and setup data are stored on the hard disk.
- The system is powered off.

> **Note**
>
> The computer cannot enter hibernation mode when the computer is powered with ac power and a communication PC Card is used.

Events that initiate hibernation mode:

- Hibernation mode is requested by the **Fn** key (**Fn**+**F12**).
- Timer conditions are satisfied in suspend mode.
- A critically low battery condition occurs.
- The PS2 HIBernation command is set in the ThinkPad Features program.

The computer exits hibernation mode and resume operation when the power-on switch is operated. When power is turned on, the hibernation history in the boot record on the hard disk is recognized and system status is restored from the hard disk to resume operation.

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Symptom-to-FRU Index

The Symptom-to-FRU Index lists the symptoms and errors and the possible causes. The most likely cause is listed first.

Note: Perform the FRU replacement or actions in the sequence shown in the "FRU/Action" columns. If a FRU did not solve the problem, put the original part back in the computer. Do not replace a nondefective FRU.

This index can also be used to help you decide which FRUs to have available when servicing a computer.

Numeric error codes show the errors detected in POST or system operation. In the following error codes, **X** can be any number.

If no codes are available, use narrative symptoms.

If the symptom is not listed, go to "Undetermined Problems" on page 149.

> **Note:** For IBM devices not supported by diagnostic codes in the ThinkPad notebook computers, see the manual for that device.

Numeric Error Codes

Symptom / Error	FRU / Action in Sequence
10X 101: Interrupt failure. 102: Timer failure. 103: Timer interrupt failure. 104: Protected mode failure. 105: Last 8042 command not accepted. 107: NMI test failure. 108: Timer bus test failure. 109: Low meg-chip select test.	1. **System board**
110 (Planar parity.)	1. **Go to "Memory Checkout" on page 128.** 2. DIMM card 3. The computer is attached to the expansion unit. 4. System board

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Symptom / Error	FRU / Action in Sequence
111 (I/O parity.)	1. **Go to "Memory Checkout" on page 128.** 2. System board
161 (Dead battery.)	1. **Go to "Checking the Backup Battery" on page 134.** 2. Backup battery 3. System board
163 (Time and date was not set.)	1. **Set time and date** 2. System board
173 (Configuration data was lost.)	1. **Select OK in the error screen; then set the time and date.** 2. Backup battery 3. System board
174 (Configuration error: Perform"Checking the Installed Devices List" on page 152 before changing any FRUs.)	1. **Check device configuration.** 2. Hard disk drive assembly 3. System board
184 (POP check sum error.)	1. **Reset the POP (power-on password) in Easy-Setup.**
190 (Depleted battery pack was installed when the power was on.)	1. **Go to "Checking the Battery Pack" on page 133.**
191XX (PM initialization error.)	1. **System board**
195 (The configuration read from the hibernation area does not match the actual configuration.)	1. **Check if the configuration was changed.** For example, check if the DIMM card is added.
196 (Read error occurred in the hibernation area of the HDD.)	1. **Run the hard disk drive test.** 2. Hard disk drive
1XX	1. **System board**

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Symptom / Error	FRU / Action in Sequence
2XX 201: Memory data error. 202: Memory line error 00–15. 203: Memory line error 16–23. 205: Memory test failure on on-board memory. 221: ROM to RAM remap error.	1. **Go to "Memory Checkout" on page 128.** 2. DIMM card 3. System board
301, 303, 304, 305, 3XX (301: Keyboard error.)	1. **Go to "Keyboard or Auxiliary Input Device Checkout" on page 129.** 2. Keyboard 3. External numeric keypad 4. External keyboard 5. Keyboard/mouse cable 6. System board
601, 6XX (601: Diskette drive or controller error.)	1. **Go to "Diskette Drive Checkout" on page 130.** 2. Diskette drive assembly 3. Diskette 4. System board
602 (Diskette read error.)	1. **Go to "Diskette Drive Checkout" on page 130.** 2. Diskette 3. Diskette drive assembly
604 (Unacceptable ID was read from the diskette drive.)	1. **Go to "Diskette Drive Checkout" on page 130.** 2. Diskette drive assembly 3. System board
11XX 1101: Serial_A test failure.	1. **Serial device** 2. Communication cable 3. System board
12XX 1201: Serial_B test failure.	1. **System board (infrared)**
17XX 1701: Hard disk controller failure. 1780, 1790: Hard disk 0 error. 1781, 1791: Hard disk 1 error.	1. **Hard disk drive** 2. System board

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Symptom / Error	FRU / Action in Sequence
24XX (2401: System board video error.)	1. **System board**
808X 8081: PCMCIA presence test failure. (PCMCIA revision number also checked.) 8082: PCMCIA register test failure.	1. **PCMCIA Slot Assembly** 2. PCMCIA device 3. System board
860X (Pointing device error when TrackPoint III is disabled.) 8601: System bus error–8042 mouse interface. 8602: External mouse error. 8603: System bus error or mouse error.	1. **External mouse** 2. External keyboard 3. System board
861X (Pointing device error when TrackPoint III is enabled.) 8611: System bus error–I/F between 8042 and IPDC. 8612: TrackPoint error. 8613: System board or TrackPoint error.	1. **Reseat the keyboard cable on the system board.** 2. Keyboard 3. External mouse 4. System board
I9990301 **I9990302** **I9990305** I9990301: Hard disk error. I9990302: Invalid hard disk boot record. I9990305: No bootable device.	1. **Check that the operating system is installed in the HDD. If not, install the operating system.** 2. Reseat the boot device. 3. Check the startup sequence for the correct boot device. 4. Check that the operating system has no failure and is installed correctly.
I9990303 (Bank–2 flash ROM check sum error.)	1. **System board**
Other codes not listed above	1. **Go to “Undetermined Problems” on page 149.**

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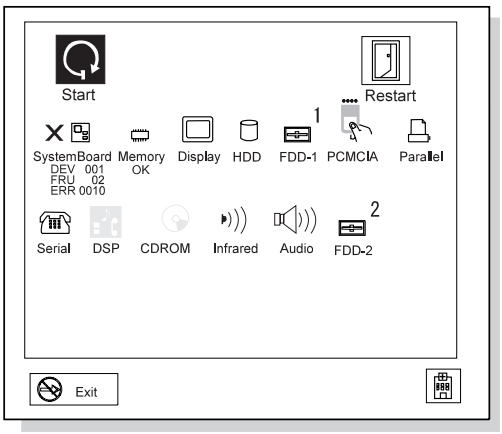
Diagnostic Error Codes

If an error is detected, the following appears:

- Large **X** on the left side of the device icon.
- Device ID (three digit)
- FRU code (four digit)
- Error code (two digit)



The device ID and error code indicate the detailed portion of the FRU that caused the error. If replacing a FRU does not correct the problem, see the device ID or error code from the previous failure. If they have changed, the cause might be because the new FRU is detective or that the FRU was incorrectly installed.

Device ID: If an error is detected by the diagnostic tests, a three-digit device ID is displayed, indicating the suspected device.

Icon	Device ID	Suspected Device
SystemBoard	001	System board
	003	Keyboard
	007	Math coprocessor
	086	Pointing device
Memory	002	Memory
Display	050	Display
HDD	017	Hard disk drive

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Icon	Device ID	Suspected Device
FDD-1	006	External diskette drive or FDD connector of the computer
FDD-2	066	External diskette drive or FDD Connector of the port replicator
PCMCIA	080	PCMCIA
Parallel	009	Parallel
Serial	011, 012	Serial
Infrared	103	IR
Audio	150	Audio (ESS)

FRU Codes: If an error is detected by the diagnostic tests, a four-digit FRU code is displayed. The FRU code indicates two suspected FRUs. Replace the FRU that is indicated by the ***two leftmost digits*** first; then replace the FRU that indicated by the ***two rightmost digits.*** No FRU is assigned to code 00. If only one FRU is suspected, the other FRU code is filled with zeros. See the reference page before replacing the FRU.

FRU Code	FRU
10	System board
30	Reserved
32	External keyboard
33	External mouse
40	LCD assembly
45	External CRT
50	1. Reseat the diskette drive (FDD-1) 2. Diskette drive (FDD-1)
51	1. Reseat the diskette drive (FDD-2) 2. Diskette drive (FDD-2)
60	1. Reseat the hard disk drive 2. Hard disk drive

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FRU Code	FRU
72	PCMCIA slot assembly

If the problem still remains after replacement of the FRUs, go to “Undetermined Problems” on page 149.

Beep Symptoms

Symptom / Error	FRU / Action in Sequence
Continuous beeps.	**System board**
One beep and a blank, unreadable, or flashing LCD.	1. **Reseat the LCD connector**. 2. LCD assembly 3. System board
One beep, and the message “Unable to access boot source.”	1. **Boot device** 2. System board
One long and two short beeps, and a blank or unreadable LCD.	1. **System board** 2. LCD assembly
One long beep followed by four short beeps each time the power switch is operated. (System cannot power on due to low battery voltage.)	**Connect the AC Adapter or install a fully charged battery.**
One beep every second. (System is shutting down due to low battery voltage.)	**Connect the AC Adapter or install a fully charged battery. (Allow the system to completely shut down before changing the battery).**
Two short beeps with error codes.	**POST error. See “Numeric Error Codes” on page 138.**
Two short beeps with blank screen.	**System board**

No Beep Symptoms

Symptom / Error	FRU / Action in Sequence
No beep, power-on indicator not on, and a blank LCD during POST.	1. **Go to “Power Systems Checkout” on page 131.** 2. DC/DC card 3. System board 4. Power sources
No beep, power-on indicator on, and a blank LCD during POST.	• **DC/DC card** • System board
No beep, power-on indicator on, and a blinking cursor only during POST.	• **DC/DC card** • System board

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Symptom / Error	FRU / Action in Sequence
No beep during POST but system runs correctly.	1. **Turn the volume up and check the speaker.** 2. Speaker 3. System board

LCD-Related Symptoms

Important

The LCD for the notebook computer contains over 921,000 thin-film transistors (TFTs). A small number of missing, discolored, or lighted dots (on all the time) is characteristic of TFT LCD technology, but excessive pixel problems can cause viewing concerns. The LCD should be replaced if the number of missing, discolored, or lighted dots in any background is 21 or more.

Symptom / Error	FRU / Action in Sequence
No beep, power-on indicator on, and a blank LCD during POST.	• **DC/DC card** • System board
• LCD backlight not working, or • LCD too dark, or • LCD brightness cannot be adjusted, or • LCD contrast cannot be adjusted.	1. **Reseat the LCD connectors.** 2. LCD assembly 3. System board
• LCD screen unreadable, or • Characters missing pels, or • Screen abnormal, or • Wrong color displayed.	1. **See important note for "LCD-Related Symptoms."** 2. Reseat all LCD connectors. 3. LCD assembly 4. System board
LCD has extra horizontal or vertical lines displayed.	**LCD assembly**

Keyboard or TrackPoint III Related Symptoms

Symptom / Error	FRU / Action in Sequence
Keyboard (one or more keys) does not work.	1. **Reseat the keyboard cable on the system board**. 2. Keyboard 3. System board

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Symptom / Error	FRU / Action in Sequence
TrackPoint III does not work.	1. **Reseat the keyboard cable on the system board.** 2. Go to “TrackPoint III Checkout” on page 130. 3. Keyboard 4. System board
Pointer moves automatically or does not work correctly.	**See “TrackPoint III Checkout” on page 130.**

Indicator-Related Symptoms

Symptom / Error	FRU / Action in Sequence
Indicator incorrectly remains off or on, but system runs correctly.	• **System board** • DC/DC card
Battery power status indicator blinks from green, yellow, to orange.	1. **Check that a correct battery is installed.** 2. Battery pack 3. DC/DC card 4. System board
Battery indicator does not turn on when the battery is installed.	c. • **DC/DC card** • Battery pack • System board

Power-Related Symptoms

Symptom / Error	FRU / Action in Sequence
Power shuts down during operation.	1. **Go to “Power Systems Checkout” on page 131.** 2. Battery pack 3. Remove the battery pack and let it cool for 2 hours. 4. DC/DC card 5. System bard 6. Power sources
The system does not power off. (See “Power Shutdown Switch” on page 126.)	1. **Press the power shutdown switch.** 2. DC/DC card 3. System board

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Function-Related Symptoms

Symptom / Error	FRU / Action in Sequence
The system does not suspend or resume when the LCD is closed or opened.	1. **Go to "Suspend Mode" on page 38, and check that the computer can enter suspend mode.** 2. Boot an operating system and press **Fn+F4.** If the computer enters suspend mode, suspect that the application program is not working properly. 3. LCD assembly 4. System board
Battery Fuel-Gauge does not go higher than 90%.	**Go to "Checking the Battery Pack" on page 133 and see the note.**
Memory count (size) appears different from actual size.	**Go to "Memory Checkout" on page 128.**
System configuration does not match the installed devices.	**Go to "Checking the Installed Devices List" on page 152.**
System hangs intermittently.	**Go to "Intermittent Problems" on page 148.**

Peripheral-Device-Related Symptoms

Symptom / Error	FRU / Action in Sequence
External display does not work correctly.	**See "External Display Self-Test" in "Common Devices Checkout" section.**
Printer problems.	1. **Run printer self-test**. 2. Parallel port device 3. Cable 4. System board
Serial or parallel port device problems.	1. **Device** 2. Device cable 3. System board

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Infrared-Related Symptoms

Symptom / Error	FRU / Action in Sequence
Unable to communicate using the Infrared (IR) Port.	1. **Make sure the setup for the IR is correct.** 2. Make sure there are no fluorescent lights near the computer. The computer may receive optical noise from the fluorescent light. 3. Run the advanced diagnostic test. If an error occurs and a FRU code is displayed, replace the parts shown by the FRU code.

Other Symptoms

Symptom / Error	FRU / Action in Sequence
Errors occur only when the port replicator is used.	**See "Port Replicator Checkout" on page 134.**
PCMCIA slot pin is damaged.	**PCMCIA slots assembly**

Note: If you cannot find a symptom or error in this list and the problem remains, see "Undetermined Problems" on page 149.

Intermittent Problems

Intermittent system hang problems can be caused by a variety of reasons that have nothing to do with a hardware defect, such as: cosmic radiation, electrostatic discharge, or software errors. FRU replacement should be considered only when a recurring problem exists.

When analyzing the intermittent problem, do the following:

1. Run the advanced diagnostic test for the system board in loop mode at least 10 times.
2. If no error is detected, do **not** replace any FRUs.
3. If any error is detected, replace the FRU shown by the FRU code. Rerun the test to verify that no more errors exist.

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Undetermined Problems

You are here because the diagnostic tests did not identify which adapter or device failed, installed devices are incorrect, a short circuit is suspected, or the system is inoperative. Follow these procedures to isolate the failing FRU (do not isolate nondefective FRUs).

Verify that all attached devices are supported by the computer.

Verify that the power supply being used at the time of the failure is operating correctly. (See "Power Systems Checkout" on page 131.)

1. Power off the computer.
2. Check the cables, wires, and connectors for short circuits and open circuits. Visually check them for damage. If any problems are found, replace the FRU.
3. Remove or disconnect all of the following devices:
   a. Non-IBM devices
   b. Devices attached to the expansion bus connector
   c. Printer, mouse, and other external devices
   d. Battery pack
   e. Hard disk drive
   f. Diskette drive
   g. DIMM
   h. PC Cards
4. Power on the computer.
5. Determine if the problem has changed.
6. If the problem does not recur, reconnect the removed devices one at a time until you find the failing FRU.
7. If the problem remains, replace the following FRUs one at a time. Do not replace a nondefective FRU.
   - LCD assembly
   - System board

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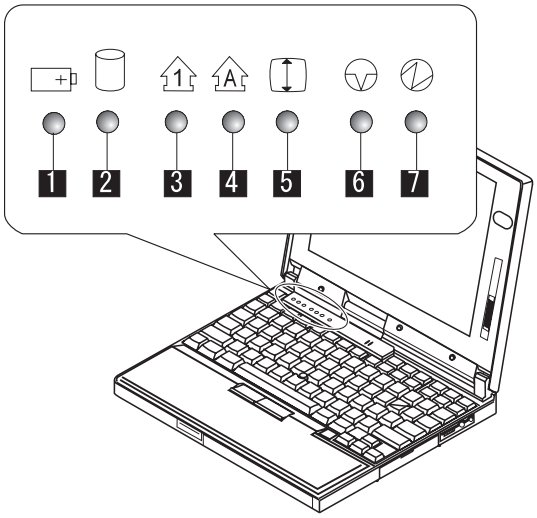
Related Service Procedures

This section provides information about the following:

- “Status Indicators”
- “Running the Diagnostics” on page 151
- “Displaying the Error Log” on page 152
- “Checking the Installed Devices List” on page 152
- “Running a Low-Level Format” on page 153
- “Checking the PC Test Card LED” on page 153
- “Fn Key Combinations” on page 153

Status Indicators

The system status indicators show the current computer status in different colors (green and orange).



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Symbol	Color	Meaning
1 Battery	Green	Battery fully charged
	Orange	Battery charging
	Blinking orange	Battery needs charging
2 Hard Disk In Use	Orange	Data is read from or written to the hard disk drive.
3 Numeric Lock	Green	Numeric keypad on the keyboard is enabled.
4 Caps Lock	Green	Caps lock mode is enabled.
5 Scroll Lock	Green	Arrow keys can be used as screen-scroll function key.
6 Suspend Mode	Green	Suspend mode
	Blinking Green	Entering suspend mode
7 Power On	Green	Power on

Running the Diagnostics

Use either the TrackPoint III or the cursor move keys to interact with the tests. The **Enter** key works the same as selecting the **OK** icon to reply OK.

Note: The following tools are required:

FDD: Erasable 2HD diskette
Parallel: Wrap plug (P/N 72X8546)
Serial: Wrap plug (P/N 72X8546)
PCMCIA: PC Test Card (P/N 35G4703)

1. Press and hold the **F1** key; then power on the computer. Hold the **F1** key down until the Easy-Setup screen appears.
2. Select **Test** and press Enter.
3. Select a device and press **Enter** to run the test.
4. The test progress screen appears.
5. **OK** appears when the test ends without any errors.
6. Start the **Advanced Diagnostic test** by pressing **Ctrl**+**A** on the basic diagnostic menu screen.
7. Select **Tool** to install the tools.
8. Select a device, press the **Spacebar**, and install the tool. You can install the multiple devices by repeating this step.
   A √ mark appears beside the selected devices.

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9. Select **OK** and press **Enter** if the selection is OK.
10. Select a device and press **Enter** to start the tests.
11. Select **Test All** to test all devices.
12. Select **Loop Test** to run the tests in a repeated loop. A loop option menu appears in which a device loop or all-device loop can be selected. Select a device and press the **Spacebar** to select a device. Repeat this step to select multiple devices. Press **Enter** to start the diagnostic loop. If no device is selected, all device tests are looped.
13. To exit the loop, keep pressing **Ctrl**+**Pause** until the test exits. A beep sounds to notify that the exit interrupt is sensed by the test program.

Displaying the Error Log

Diagnostic errors are printed on the printer that is attached to the parallel port when the error is detected. The error is also logged in the system memory.

Do the following to display the errors.

1. End the test, if it is running.
2. Press **Ctrl**+**A** to select the advanced diagnostic mode.
3. Press **Ctrl**+**E**.
4. The error log appears.
5. To exit the screen, select the cancel icon or press **Esc**.

The error log is not saved when the system is powered off.

Checking the Installed Devices List

If a device is installed but the icon appears in a gray shade rather than a dark shade on the basic diagnostics screen, the device is defective. Reseat the device connectors. If the symptom remains, replace the device or the system board. If needed, adjust the contrast control to clearly distinguish the shades of the icon.

If a device that is not installed appears in a dark shade (for example, FDD-2 appears in a dark shade when *NO* second FDD is installed), do the following:

1. Replace the **first** device in the configuration, such as an FDD-1.
2. If the problem remains, replace the system board.

The Parallel, and Serial icons are always displayed in a dark shade, because the icons represent subsystems of the system board and not the attachment of the devices.

The FDD-1 icon represents the **first** drive in the system configuration for each type of device. For Model ThinkPad 720 and 720C, FDD-1 represents an external diskette drive attached through the external diskette drive connector. Similarly, the FDD-2 icon represents the **second** drive, usually attached through a port replicator.

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Running a Low-Level Format

Do the following to format the hard disk.

Warning: Make sure the drive address to be formatted is correct. This procedure erases all information on the disk.

1. Power off the computer.
2. Insert the **ThinkPad hardware maintenance diskette Ver 1.30** or later into diskette drive **A** and power on the computer.
3. Select **Format the hard disk** from the main menu.
4. Select the drive from the menu.
5. Follow the instructions on the screen.

Checking the PC Test Card LED

The green LED on the PC test card turns on when the PCMCIA test is running. If the LED does not turn on, check that the card is installed correctly by reseating the card. If it still does not turn on after it is reseated, try using another slot for the test. If the LED still does not turn on and the test fails, replace the FRU shown by the diagnostic error code.

Fn Key Combinations

The following table shows the **Fn** key and function key combinations and their corresponding functions.

The **Fn** key works independently from the operating system. The operating system obtains the status through the system management interface to control the system.

Fn +	**Description**
F1	Reserved
F2	Fuel-Gauge display on or off
F3	Standby mode invocation
F4	Suspend mode invocation
F5	Reserved
F6	Reserved
F7	Switching between LCD and CRT display
F8	Reserved
F9	Reserved
F10	Reserved
F11	Switching power management mode (High Power, Intelligent, and Economy)
F12	Hibernation invocation

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Product Overview (560, 560E)

The following table is an overview of the system features.

Feature	Description
Processor	**560** • Intel® Pentium® 100 MHz • Intel Pentium 120 MHz • Intel Pentium 133 MHz **560E** • Intel Pentium MMX™ 150 MHz, L2 cache • Intel Pentium MMX 166 MHz, L2 cache
Bus Architecture	PCI Bus
Memory (Standard)	**560** • 8MB (on the system board) **560E** • 16MB (on the system board)
Memory (Option)	**560** • 8MB, 16MB, 32MB DIMM card (max. 40MB) **560E** • 8MB, 16MB, 32MB, 64MB DIMM card (max. 80MB)
CMOS RAM	114 bytes
VGA Video	**560** • 11.3-inch, 256 colors, 800×600 pixel DSTN color LCD • 12.1-inch, 64K colors, 800×600 pixel TFT color LCD **560E** • 11.3-inch, 64k colors 800×600 pixel DSTN color LCD • 12.1-inch, 256K colors, 800×600 pixel TFT color LCD
Diskette Drive (External)	• 1.44MB (2-mode), 3.5-inch • 1.44MB (3-mode), 3.5-inch, for Japan
Hard Disk Drive	**560** • 810MB, 2.5-inch, IDE interface • 1.08GB, 2.5-inch, IDE interface • 2.1GB, 2.5-inch, IDE interface **560E** • 2.1GB, 2.5-inch, IDE interface
I/O Port	• Headphone • Microphone • Port replicator

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Feature	Description
Audio	• 16-bit audio • Internal speaker • Internal microphone • Mechanical volume
Infrared Transfer	**560** • IrDA** 1.0 **560E** • IrDA 1.1
PCMCIA	One Type-III or two Type-II

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FRU Removals and Replacements

This section contains information about removals and replacements.

- Do not damage any parts. Only certified, trained personnel should service the computer.
- The arrows in the “Removals and Replacements” section show the direction of movement to remove a FRU, or to turn a screw to release the FRU. The arrows are marked in numeric order, in square callouts, to show the correct sequence of removal.
- When other FRUs must be removed before the failing FRU is removed, they are listed at the top of the page.
- To replace a FRU, reverse the removal procedure and follow any notes that pertain to replacement. See “Locations” for internal cable connections and arrangement information.
- When replacing a FRU, use the correct screw size as shown in the procedures.

Safety Notice 1: Translation on page 8

Before the computer is powered-on after FRU replacement, make sure all screws, springs, or other small parts, are in place and are not left loose inside the computer. Verify this by shaking the computer and listening for rattling sounds. Metallic parts or metal flakes can cause electrical short circuits.

Safety Notice 3: Translation on page 10

The battery pack contains small amounts of nickel. Do not disassemble it, throw it into fire or water, or short-circuit it. Dispose of the battery pack as required by local ordinances or regulations.

Safety Notice 8: Translation on page 14

Before removing any FRU, power-off the computer, unplug all power cords from electrical outlets, remove the battery pack, and then disconnect any interconnecting cables.

Safety Notice 4: Translation on page 11

The lithium battery can cause a fire, explosion, or severe burn. Do not recharge it, remove its polarized connector, disassemble it, heat it above 100°C (212°F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

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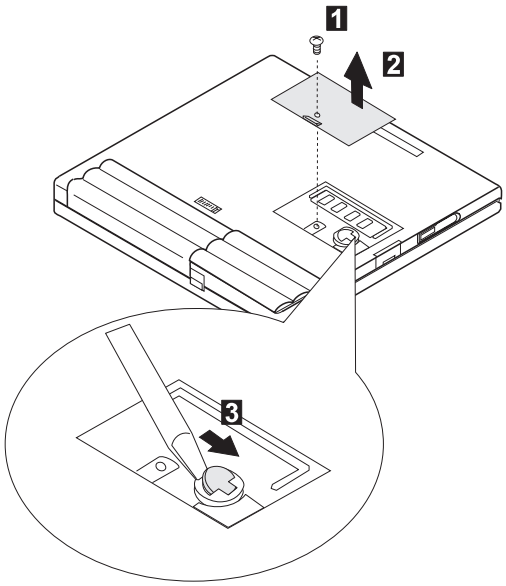
1010 Backup Battery

Safety Notice 4: Translation on page 11

The lithium battery can cause a fire, explosion, or severe burn. Do not recharge it, remove its polarized connector, disassemble it, heat it above 100°C (212°F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

Turn the computer upside down.



Step	Length (Quantity)	Torque
1	7 mm, Nylon (1)	4.0 kgcm

Note: Make sure you use the correct screw and tighten it to the torque specified. Do not use the screw that you removed, use a new screw.

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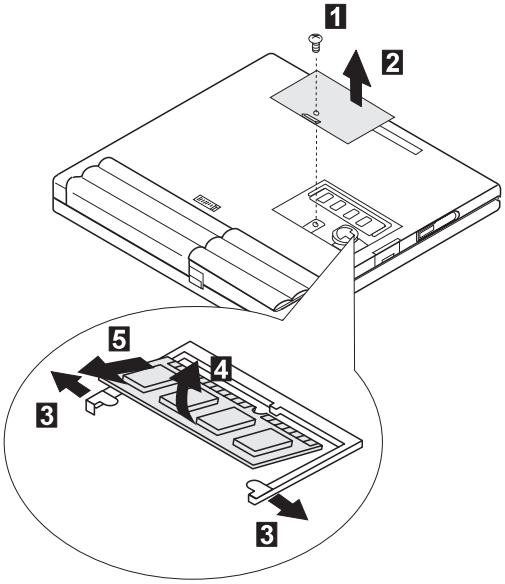
1020 DIMM (If Installed)

Turn the computer upside down.



Step	Length (Quantity)	Torque
1	7 mm, Nylon (1)	4.0 kgcm
Note: Make sure you use the correct screw and tighten it to the torque specified. Do not use the screw that you removed, use a new screw.		

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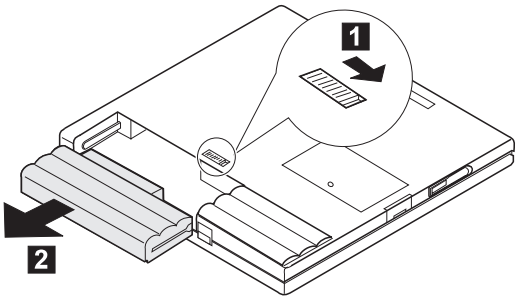
1030 Battery Pack

Turn the computer upside down.



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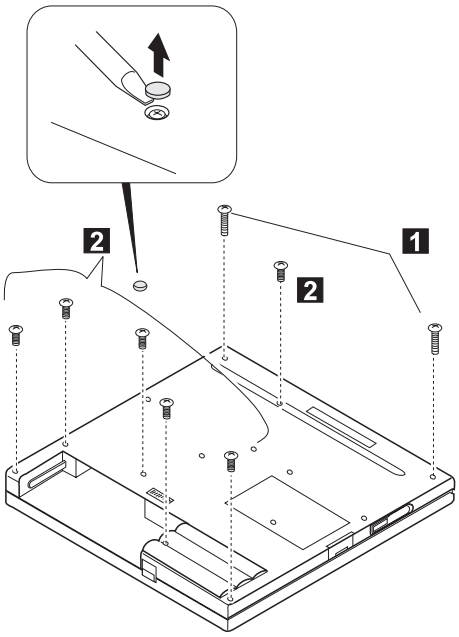
1040 Frame

- Battery Pack **(1030)**



Step	Length (Quantity)	Torque
1	12 mm, Nylon (2)	4.0 kgcm
2	7 mm, Nylon (6)	4.0 kgcm

Note: Make sure you use the correct screw and tighten it to the torque specified. Do not use the screw that you removed, use a new screw.

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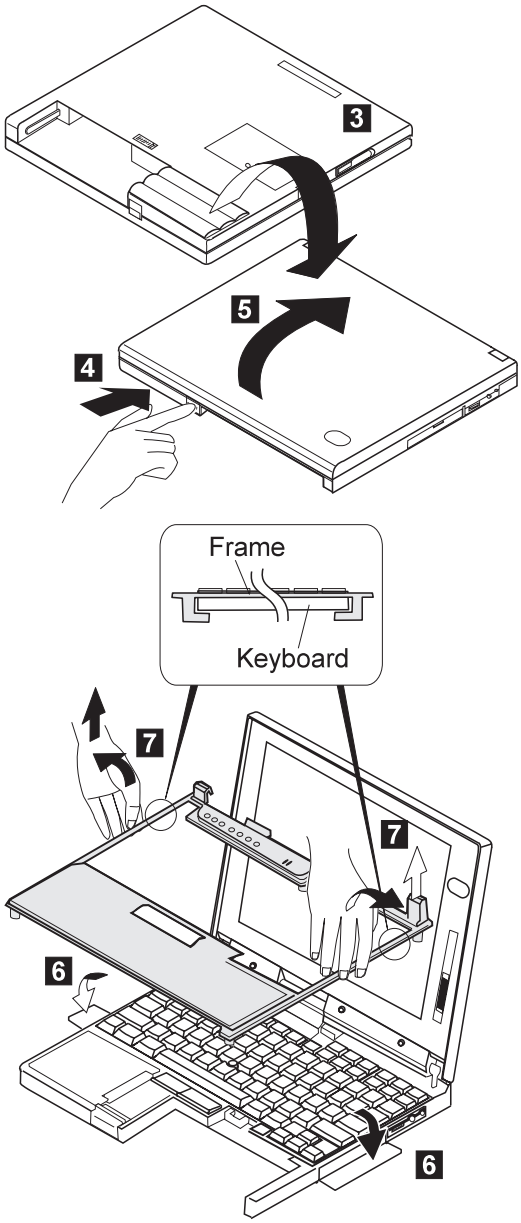

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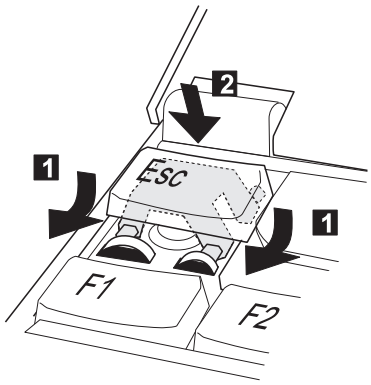
Note

- Be careful not to remove the **Esc** key when you remove the frame. If the **Esc** key is removed, replace it as shown.



- When replacing the frame, check whether the click buttons of the TrackPoint III can be pressed correctly.

  If the frame is not in place, the click buttons will not work.

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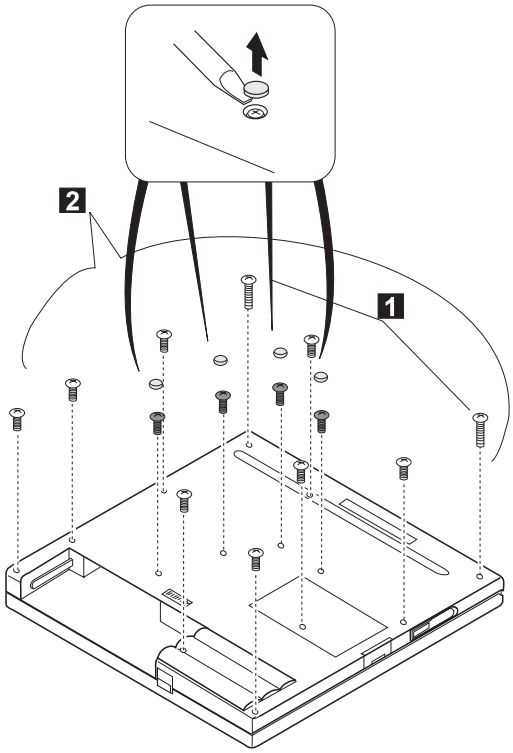
1050 Keyboard Unit

- Battery Pack **(1030)**



Step	Length (Quantity)	Torque
1	12 mm, Nylon (2)	4.0 kgcm
2	7 mm, Nylon (12)	4.0 kgcm
Note: Make sure you use the correct screw and tighten it to the torque specified. Do not use the screw that you removed, use a new screw.		

When replacing::

When replacing the frame, first replace the middle four screws shown in black in the figure; then check whether the click buttons of the TrackPoint III can be pressed correctly.

If the frame is not in place, the click buttons will not work.

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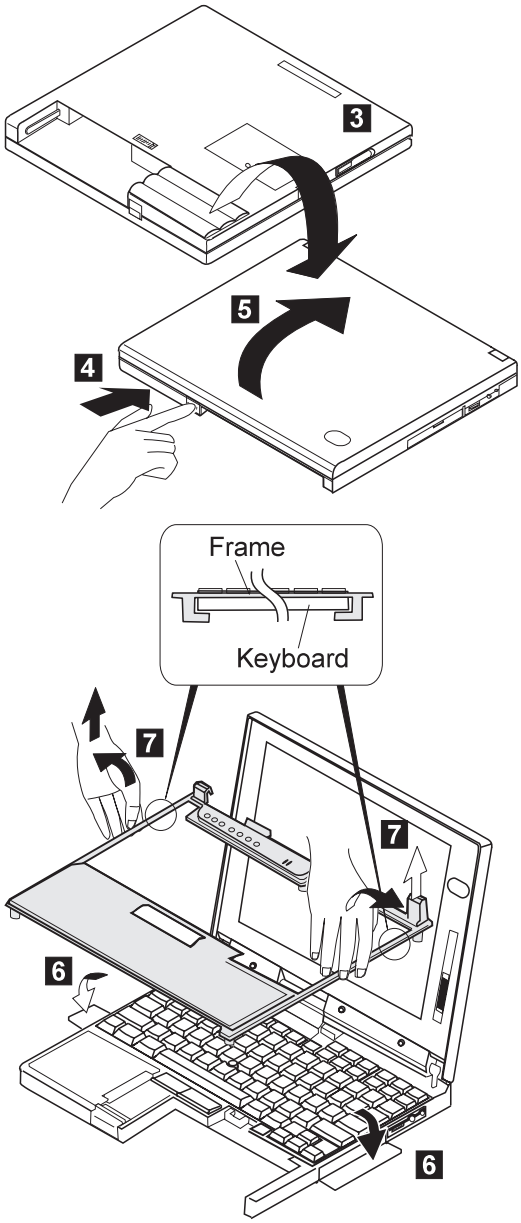

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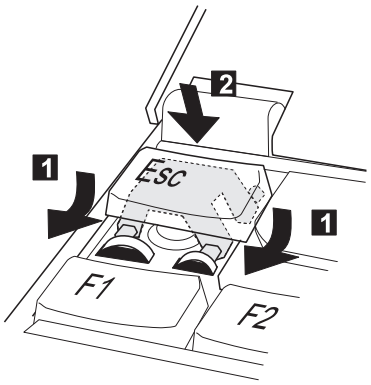
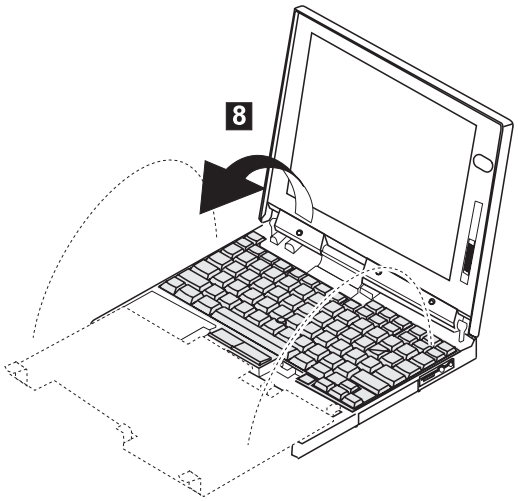
Note

Be careful not to remove the **Esc** key when you remove the frame. If the **Esc** key is removed, replace it as shown.





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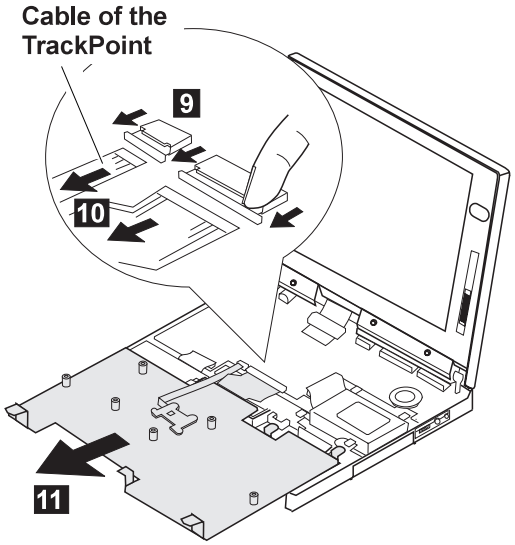

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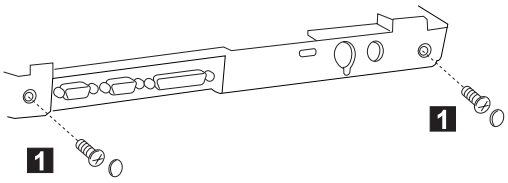
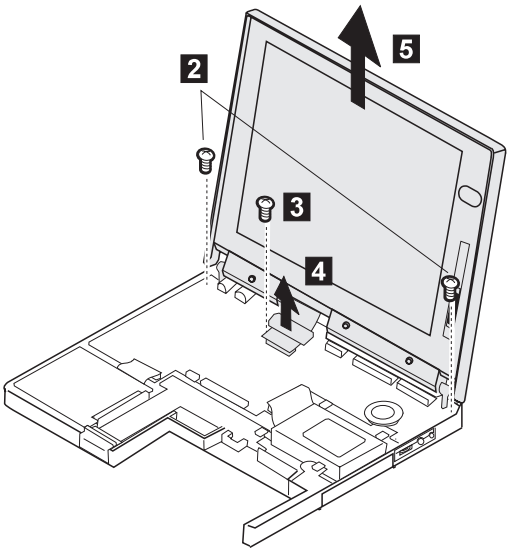
1060 LCD Assembly

- Battery Pack **(1030)**
- Keyboard Unit **(1050)**

Note: For the LCD FRU removals and replacement, go to "2010 LCD Front Cover" on page 173.





Step	Length (Quantity)	Torque
1	4 mm, flathead, Nylon (2)	4.0 kgcm
2	7 mm, Nylon (2)	4.0 kgcm
3	4 mm (1)	3.0 kgcm
Note: Make sure you use the correct screw and tighten it to the torque specified. Do not use the screw that you removed, use a new screw.		

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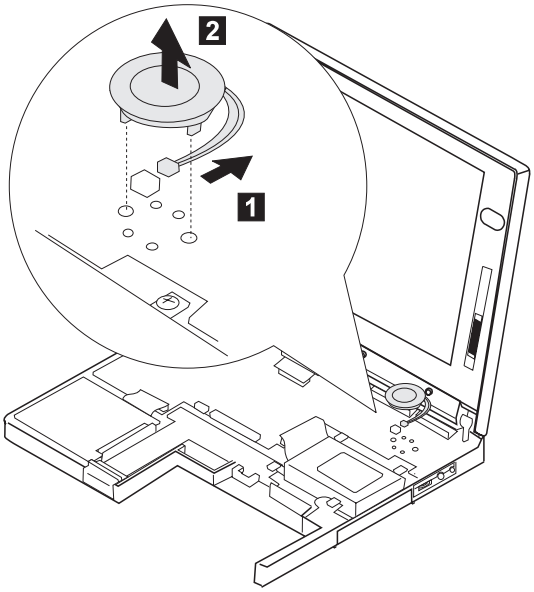
1070 Speaker

- Battery Pack **(1030)**
- Keyboard Unit **(1050)**



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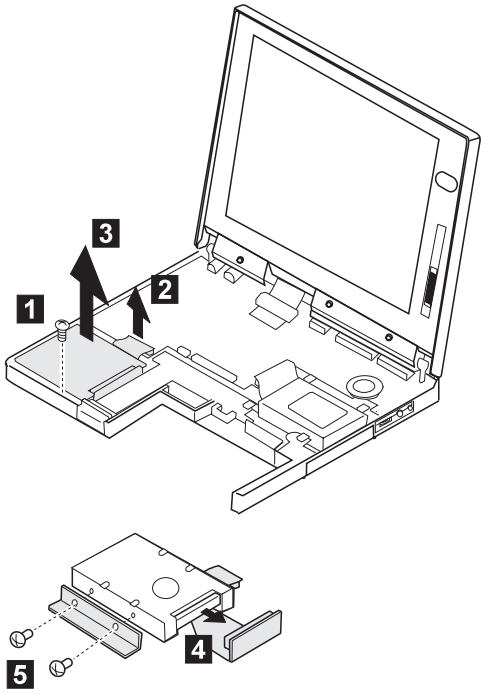
1080 Hard Disk Drive

Attention

Do not drop or apply any shock to the hard disk drive. The hard disk drive is sensitive to physical shock. Incorrect handling can cause damage and permanent loss of data on the hard disk. Before removing the hard disk drive, have the user make a backup copy of all the information on the hard disk. Never remove the hard disk drive while the system is operating or is in suspend mode. Remove the hard disk drive exactly as shown in the figure. Do not apply any extra force to the hard disk drive when removing it.

- Battery Pack **(1030)**
- Keyboard Unit **(1050)**



Step	Length (Quantity)	Torque
1	7 mm, Nylon (1)	4.0 kgcm
5	3 mm (2)	3.0 kgcm

Note: Make sure you use the correct screw and tighten it to the torque specified. Do not use the screw that you removed, use a new screw.

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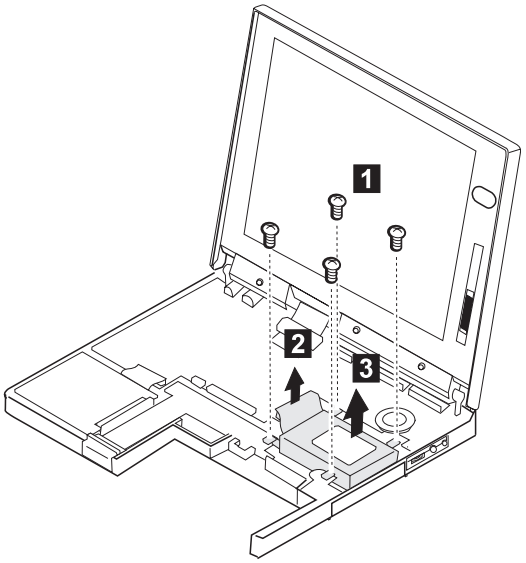
1090 PCMCIA Slot Assembly

- Battery Pack **(1030)**
- Keyboard Unit **(1050)**

Note: Before removing and replacing the PCMCIA slot assembly, make sure that the PCMCIA cards are removed and the eject levers are not sticking out.



Step	Length (Quantity)	Torque
1	7 mm, Nylon (4)	4.0 kgcm
Note: Make sure you use the correct screw and tighten it to the torque specified. Do not use the screw that you removed, use a new screw.		

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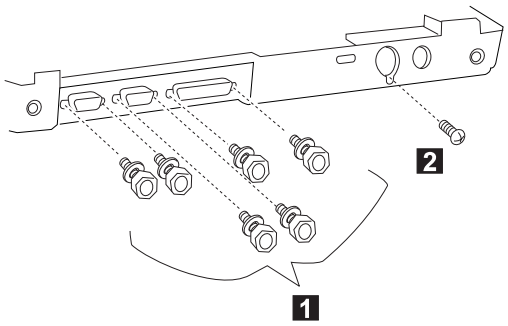
1100 System Board

- DIMM (If Installed) **(1020)**
- Battery Pack **(1030)**
- Keyboard Unit **(1050)**
- LCD Assembly **(1060)**
- Speaker **(1070)**
- Hard Disk Drive **(1080)**
- PCMCIA Slot Assembly **(1090)**

Notes:

1. The system unit serial number must be restored when the system board is replaced. To restore the system unit serial number, select the option “Set system identification” on the maintenance diskette. The flash ROM on the system board contains the vital product data (VPD) – that is, the system unit serial number, system board system number, and other computer-unique data.
2. Do not power off the computer when restoring the VPD. The system unit serial number label is attached to the base cover.



Step	Length (Quantity)	Torque
1	4 mm, X' (6)	3.0 kgcm
2	3 mm (1)	2.0 kgcm
Note: Make sure you use the correct screw and tighten it to the torque specified. Do not use the screw that you removed, use a new screw.		

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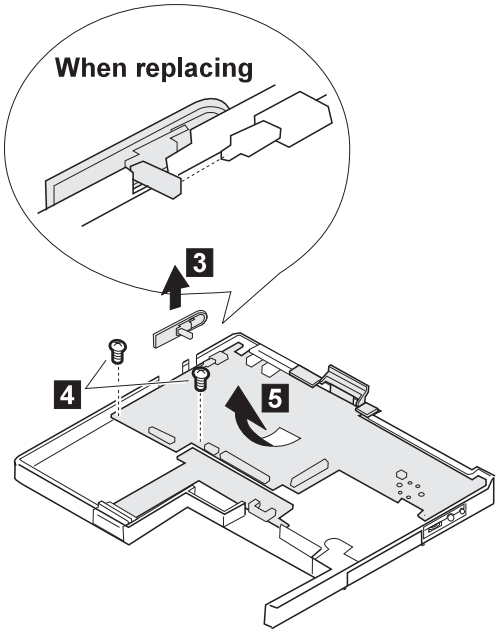
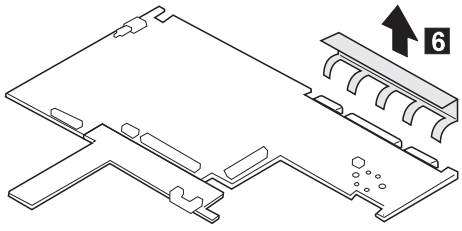


Step	Length (Quantity)	Torque
4	4 mm, Nylon (2)	4.0 kgcm
Note: Make sure you use the correct screw and tighten it to the torque specified. Do not use the screw that you removed, use a new screw.		



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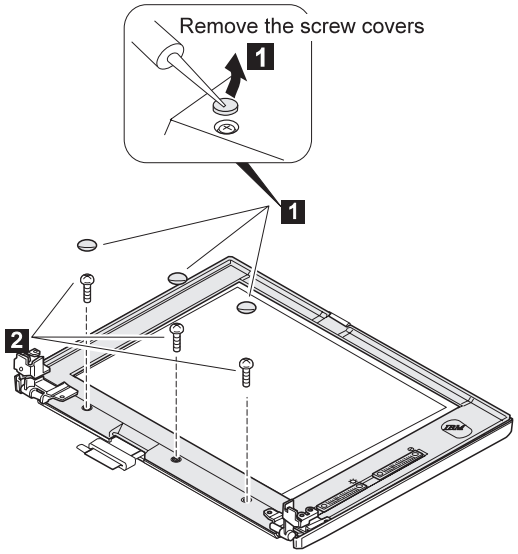
2010 LCD Front Cover

- Battery Pack **(1030)**
- Keyboard Unit **(1050)**
- LCD Assembly **(1060)**

Important

The LCD for the notebook computer contains over 921,000 thin-film transistors (TFTs). A small number of missing, discolored, or constantly lighted dots is characteristic of TFT LCD technology, but excessive pixel problems can cause viewing concerns. The LCD should be replaced if the number of missing, discolored, or lighted dots in any background is 21 or more.



Step	Size (Quantity)	Torque
2	M 2.5 x 6 mm, flathead (3)	3.0 kgcm

Note: Make sure you use the correct screw and tighten it to the torque specified. Do not use the screw that you removed, use a new screw.

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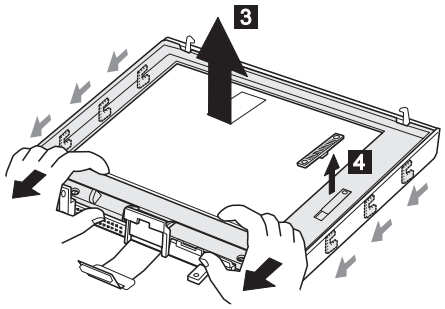
- The LCD front cover has several latches. Release the latches as shown in step 3 .
- For the DSTN LCD, there are two slide knobs in step 4 .



When replacing:

Make sure that the slide knobs work correctly.

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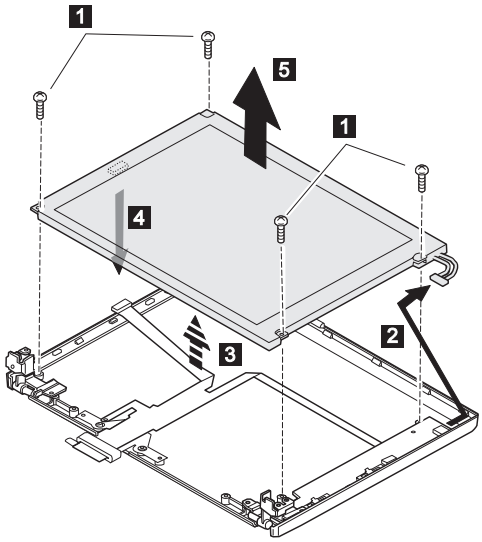
2020 LCD Panel

- Battery Pack **(1030)**
- Keyboard Unit **(1050)**
- LCD Assembly **(1060)**
- LCD Front Cover **(2010)**

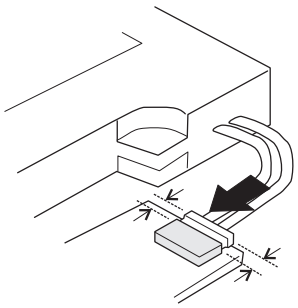
DSTN Panel



Step	Size (Quantity)	Torque
1	M 2.5 x 6 mm, flathead (4)	3.0 kgcm
Note: Make sure you use the correct screw and tighten it to the torque specified. Do not use the screw that you removed, use a new screw.		

When Replacing:

Connect the LCD connector to the inverter card by lining them up straight:



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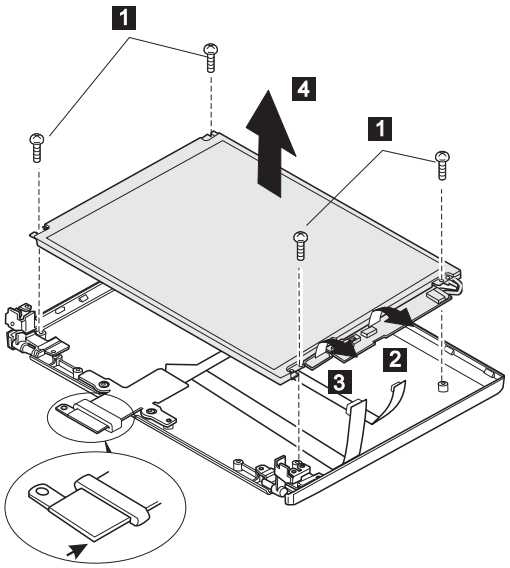
TFT Panel

TFT LCD Note

- For Model 560, use only the TFT 1 LCD.
- For Model 560E:
  - When replacing the entire LCD assembly, use only the TFT 2.
  - When replacing the an individual LCD FRU, use either the TFT 1 or the TFT 2 depending on what the other LCD FRUs in the assembling are using.

To distinguish the TFT 1 panel from the TFT 2 panel, note the shape of its cable, shown by the arrow in the circle.

TFT 1 (P/N 12J1600)



Step	Size (Quantity)	Torque
1	M 2.5 x 6 mm (4)	3.0 kgcm

Note: Make sure you use the correct screw and tighten it to the torque specified. Do not use the screw that you removed, use a new screw.

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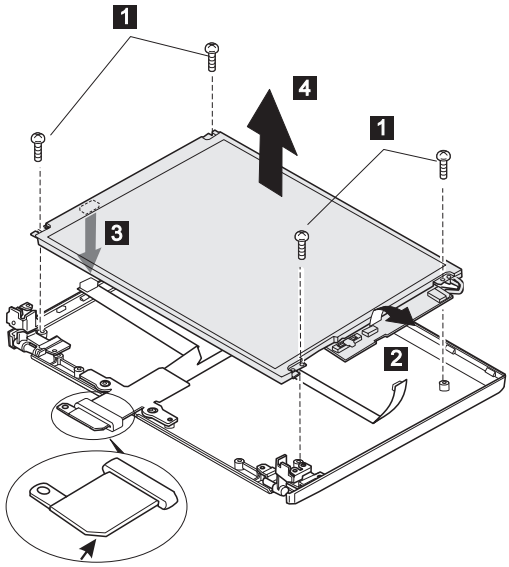
TFT 2 (P/N 11J9626)



Step	Size (Quantity)	Torque
1	M 2.5 x 6 mm (4)	3.0 kgcm

Note: Make sure you use the correct screw and tighten it to the torque specified. Do not use the screw that you removed, use a new screw.

Attention

When connecting the flexible cable to the rear of the LCD panel, do not press on the LCD glass surface. Pressing on the glass surface might damage the LCD. Press only on the connector.

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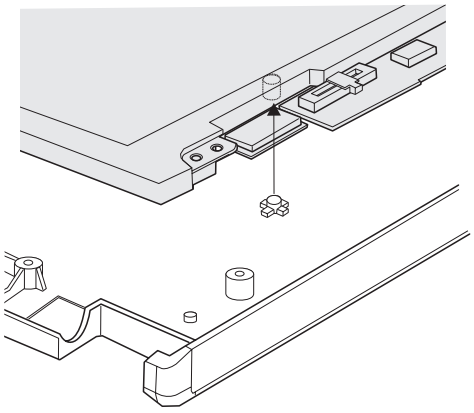
When replacing:

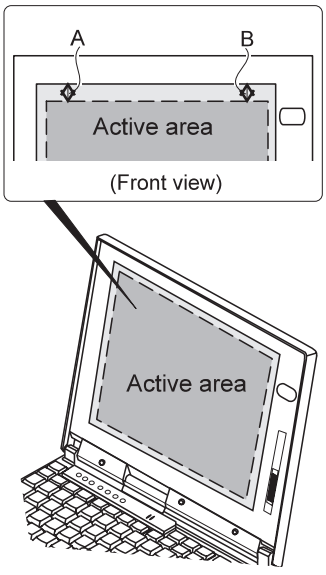
There are two types of rear covers for the Model 560E TFT LCD unit. Verify the type and follow the relevant information.

1. If there are bosses on the rear cover, put each boss into each hole of the LCD panel assembly.



2. If there are no bosses on the rear cover, assemble the panel as shown in the following figure:

   Note: The difference between A and B must be less than 0.4 mm.



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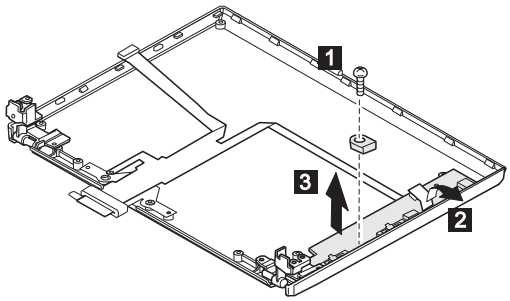
2030 Inverter Card

- Battery Pack **(1030)**
- Keyboard Unit **(1050)**
- LCD Assembly **(1060)**
- LCD Front Cover **(2010)**
- LCD Panel **(2020)**

DSTN Panel



Step	Size (Quantity)	Torque
1	M 2.5 x 6 mm, flathead (1)	3.0 kgcm
Note: Make sure you use the correct screw and tighten it to the torque specified. Do not use the screw that you removed, use a new screw.		

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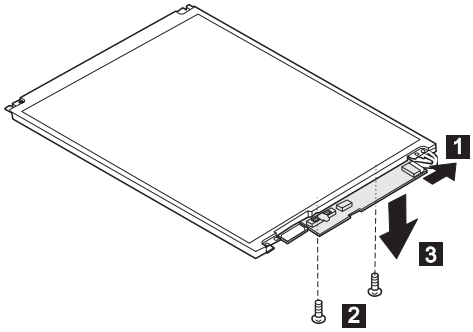
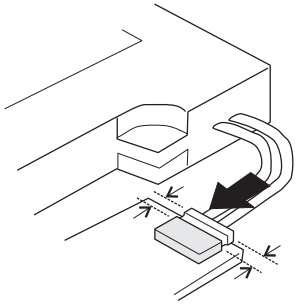
TFT Panel



When Replacing: Ensure the LCD connector and inverter card are properly aligned.



Step	Size (Quantity)	Torque
2	M 2.0 x 3.7 mm, flathead (2)	3.0 kgcm
Note: Make sure you use the correct screw and tighten it to the torque specified. Do not use the screw that you removed, use a new screw.		

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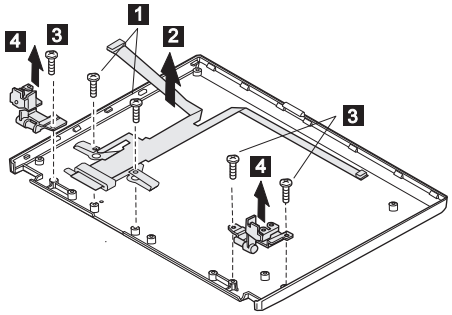
2040 LCD Cable and Hinges

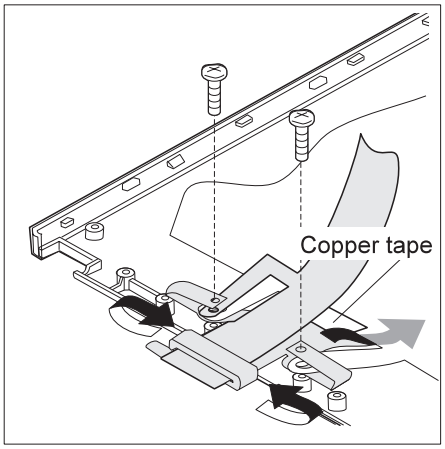
- DIMM (If Installed) **(1020)**
- Battery Pack **(1030)**
- Keyboard Unit **(1050)**
- LCD Assembly **(1060)**
- LCD Front Cover **(2010)**
- LCD Panel **(2020)**
- Inverter Card (DSTN only)**(1140)**

DSTN

- 1 2 : LCD cable
- 3 4 : Hinges



When replacing: see the following figure.



Step	Size (Quantity)	Torque
1	M 2.5 x 6 mm, flathead (2)	3.0 kgcm
3	M 2.5 x 6 mm (3) flathead	3.0 kgcm
Note: Make sure you use the correct screw and tighten it to the torque specified. Do not use the screw that you removed, use a new screw.		

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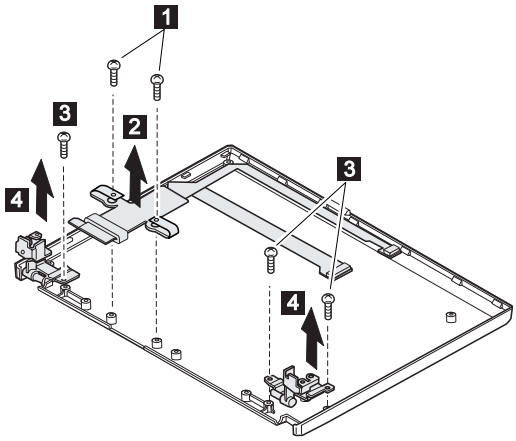
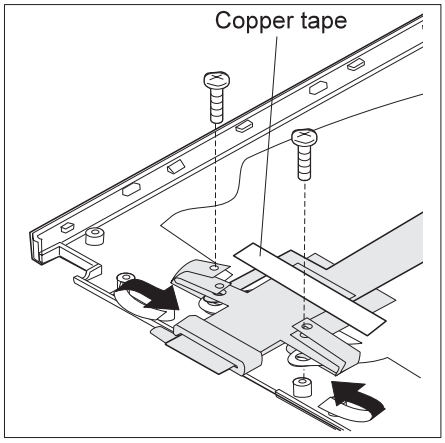
TFT

- 1 2 : LCD cable
- 3 4 : Hinges



When replacing:

See the following figure:



Step	Size (Quantity)	Torque
1	M 2.5 x 6 mm, flathead (2)	3.0 kgcm
3	M 2.5 x 6 mm (3) flathead	3.0 kgcm
Note: Make sure you use the correct screw and tighten it to the torque specified. Do not use the screw that you removed, use a new screw.		

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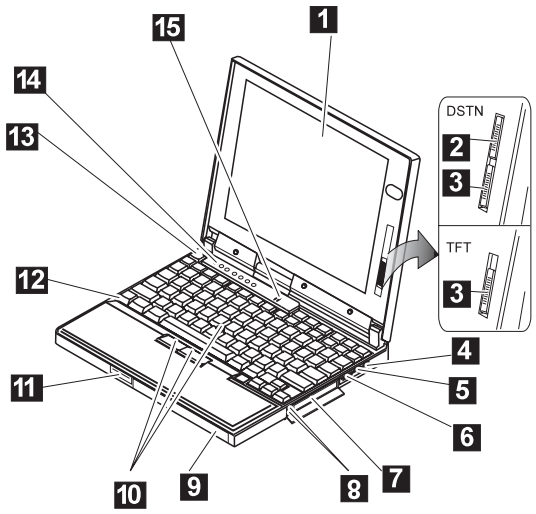
Locations

Front View

1 LCD
2 Contrast Control
3 Brightness Control
4 Headphone Jack
5 Microphone/Line-In Jack
6 Volume Control
7 PCMCIA Slots
8 PC Card Eject Buttons
9 Battery Pack
10 TrackPoint III
11 LCD Latch
12 Fn Key
13 Keyboard
14 Indicator Panel
15 Built-In Microphone



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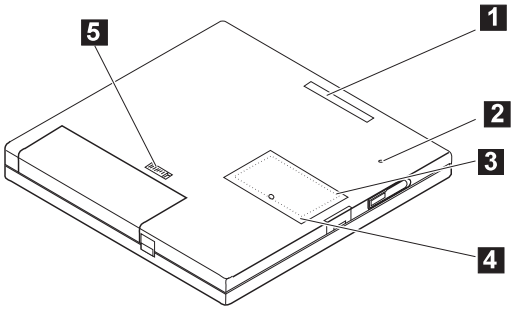
Bottom View

1. System-Expansion Connector
2. Power Shutdown Switch
3. Memory Slot
4. Memory-Slot Cover
5. Battery Pack Latch



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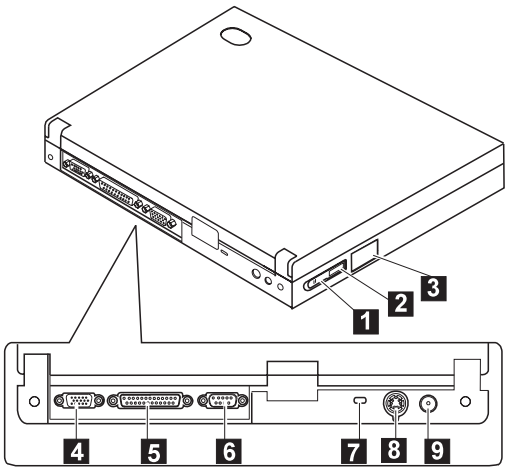
Rear View

1. Power Switch
2. IR Port
3. External Diskette Drive Connector
4. External Monitor
5. Parallel Connector
6. Serial Connector
7. Security Keyhole
8. External-Input-Device Connector
9. Power Jack



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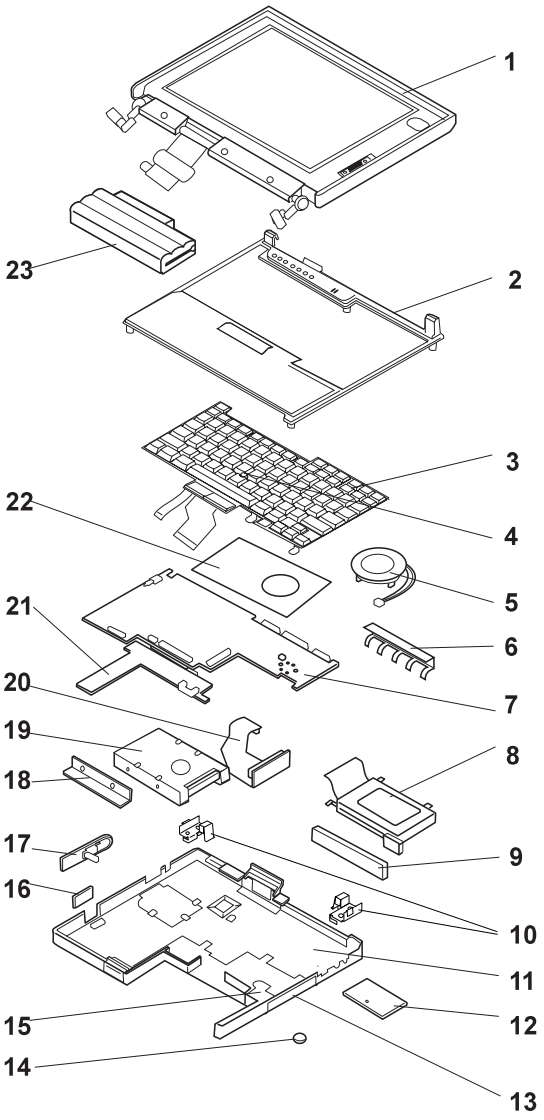
Parts Listing 560, 560E (2640)



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Index	*System Unit*	
1	LCD Assembly (11.3 DSTN) (U.S.-2640, model 1xx, 3xx, 5xx) *See "LCD FRU (DSTN)" on page 189 for LCD FRU.*	20H4267
	LCD Assembly (12.1 TFT 1) (U.S.-2640, model 2xx, Exx, Fxx) (These models may instead use TFT 2 below) *See "TFT 1 (12J1600)" on page 190 for LCD FRU.*	12J1600
	LCD Assembly (**560E**, 12.1 TFT 2) (U.S.-2640, model 2xx, 4xx, Exx, Fxx, Hxx) *See "TFT 2 (11J9626)" on page 191 for LCD FRU.*	11J9626

Note for the TFT LCD:

- For Model 560, use only the TFT 1 LCD.
- For Model 560E:
  - When replacing the entire LCD assembly, use only the TFT 2.
  - When replacing an individual LCD FRU, match the new FRU to the installed FRU.

    See "TFT Panel" on page 176 to distinguish the TFT type.

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Index	System Unit	
2	Frame	46H4141
	Note: This FRU includes two model labels. Verify the model and attach the correct label.	
3	Keyboard (see keyboard section)	
4	TrackPoint III	84G6536
5	Speaker	46H4133
6	EMI Bracket I/O	46H4149
7	System Board (100 MHz) (U.S.-2640, model 5xx)	05K4302
	System Board (120 MHz) (U.S.-2640, model Exx)	05K4303
	System Board (133 MHz) (U.S.-2640, model Fxx)	05K4304
	System Board (133 MHz) (U.S.-2640, model 1xx, 2xx)	05K4305
	System Board (**560E**, 150 MHz) (U.S.-2640, model 3xx)	05K4306
	System Board (**560E**, 166 MHz) (U.S.-2640, model 4xx, Hxx)	05K4307
8	PCMCIA Slot	46H4134
9	Rubber Cap I/O	46H4151
10	EMI Spring	46H4145
11	Base Cover	46H4084
	Base Cover (**560E**)	11J8917
12	DIMM Cover	46H4131
13	PCMCIA Cover	46H4127
14	Backup Battery	46H4132
15	Bracket Battery Guide	46H4135
16	FDD Connector Cover	46H4128
17	Power Switch	46H4138
18	HDD Bracket	46H4137
19	Hard Disk Drive (810 MB) (U.S.-2640, model 5xx, Exx)	39H2220
	Hard Disk Drive (1.0 GB) (U.S.-2640, model Fxx)	39H2221
	Note: Order either of the below hard disk drives that match the FRU number of the drive being replaced. (U.S.-2640, model 1xx, 2xx, 3xx, 4xx)	
	Hard Disk Drive (2.1 GB)	83H7080
	Hard Disk Drive (2.1 GB)	12J4569
20	HDD Flexible Cable	11J8920
21	DC/DC Card, 560 (U.S.-2640, model 1xx, 2xx, 5xx, Exx, Fxx)	05K4300
21	DC/DC Card, 560E (U.S.-2640, model 3xx, 4xx, Hxx)	05K4301
22	Keyboard Sheet	46H4150
23	Battery Pack	46H4144
	External FDD (2-mode) (U.S.-2640, model 1xx, 2xx, 3xx, 4xx, 5xx, Exx, Fxx, Hxx)	10H4056
	External FDD (3-mode)	39F2086
	External FDD Cable	12J1711
	AC Adapter (35W) 2-pin	12J1442
	AC Adapter (35W) 3-pin	12J1444
	AC Adapter	85G6698
	Screw Cap	66G5046
	Screw Cap, rear	11J8919

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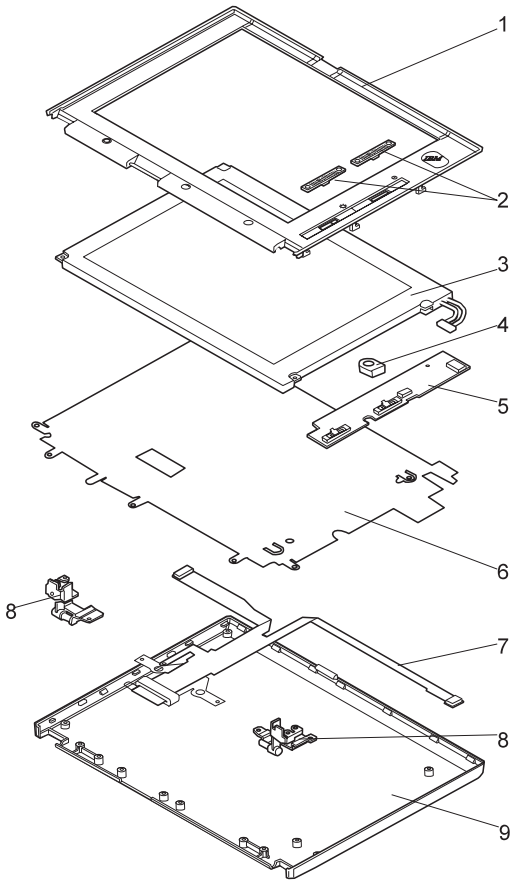
LCD FRU (DSTN)



Index	*System Unit*	
1	LCD Front Cover	20H4265
2	Control Knob	46H4158
3	LCD Panel	—
4	Spacer	46H4159
5	Inverter Card	46H4152
6	Shield Sheet	46H4157
7	LCD Cable	46H4156
8	Hinges	46H4155
9	LCD Rear Cover	20H4263

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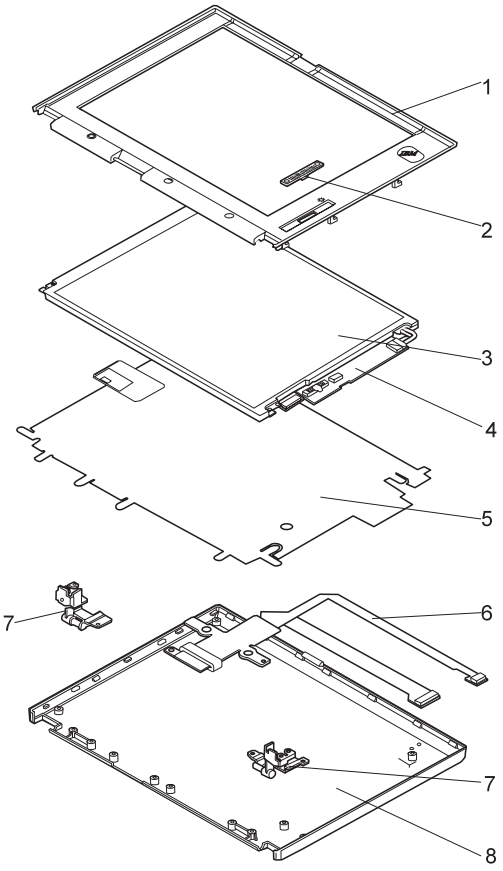
LCD FRU (TFT)

TFT 1 (12J1600)



Index	*System Unit*	
1	LCD Front Cover	05K4603
2	Control Knob	11J9664
3	LCD Panel	—
4	Inverter Card	82H5509
5	Shield Sheet	46H4165
6	LCD Cable	12J1601
7	Hinges	11J9663
8	LCD Rear Cover	11J9646

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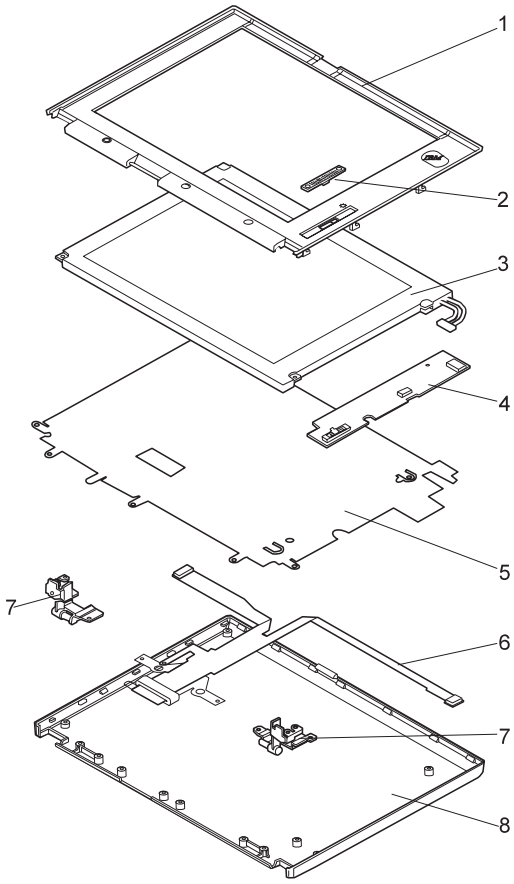
TFT 2 (11J9626)



Index	*System Unit*	
1	LCD Front Cover	11J9627
2	Control Knob	46H4224
3	LCD Panel	—
4	Inverter Card	11J9632
5	Shield Sheet	46H4165
6	LCD Cable	11J9629
7	Hinges	11J9628
8	LCD Rear Cover	11J9646

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Keyboard

Arabic	97H3886
Belgian	97H3884
Canadian French	97H3891
Danish	97H3879
Dutch	97H3878
French	97H3876
German	97H3875
Greek	97H3889
Hebrew	97H3887
Italian	97H3877
Japanese	97H3893
Korean	97H3894
Latin Spanish	97H3890
Norwegian	97H3881
Portuguese	97H3885
Russian	97H3892
Spanish	97H3880
Swedish or Finnish	97H3883
Swiss	97H3882
Turkish	97H3888
U.K. English	97H3874
U.S. English	97H3873

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Common and Option Parts List

Miscellaneous Parts

Screw Kit	12J0808
Screw Kit (M2.5 x 4 mm, nylon coating)	97H3917
Screw Kit (M2.5 x 7 mm, nylon coating)	97H3918
Screw Kit (M2.5 x 12 mm, nylon coating)	97H3919

Options

Notes:

1. When you replace the AC Adapter, use the one for the country you are in even if the computer is from a different country.
2. The warranty for the system unit does not apply to all options.

Headset	85G1529
810 MB Hard Disk Drive Assembly	39H2220
1.08 GB Hard Disk Drive Assembly	39H2221
2.1 GB Hard Disk Drive Assembly	83H7080
Microphone	66G7871
PS/2 Miniature Mouse	95F5723
ThinkPad 560 Port Replicator	05K4645
DIMM 8MB	42H2767
DIMM 16MB	42H2768
DIMM 32MB	42H2769
DIMM 64MB	42H2817
Interface Cable to System for Keyboard	84G2531
Interface Cable to Keyboard for Keypad	84G2532
Mini-DIN to Mini-DIN Cable.	84G6474

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Numeric Keypad

Belgian	95F5741
Canadian French	95F5466
Danish	95F5467
Dutch	95F5467
French	95F6313
German	95F6314
Greek	95F5467
Hebrew	95F5741
Icelandic	95F5467
Italian	95F6316
Japanese	79F6401
Norwegian	95F5467
Spanish	95F6315
Swedish or Finnish	95F5468
Swiss French	95F5711
Swiss German	95F5715
Turkish	95F5467
U.K. English	95F5741
U.S. English	95F5741

Black Keypad

French	84G6286
German	84G6280
Italian	84G6292
Swedish	84G6304
U.K. English	84G6298
Norwegian	84G6310
U.S. English	84G2530

Black Keyboard

French	84G6285
German	84G6279
Italian	84G6291
Swedish	84G6303
U.K. English	84G6297
Norwegian	84G6309
U.S. English	84G2529

Accessories

Keyboard/Mouse Cable	54G0444

Tools

Tri-Connector Wrap Plug	72X8546
PC Test Card	35G4703
Audio Wrap Cable	66G5180
Screwdriver Kit	95F3598
ThinkPad Hardware Maintenance Diskette Ver 1.30	06J0333

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Power Cords

IBM power cords for a specific country are usually available only in that country:

For 2-pin power cords:

IBM Power Cord Part Number	Used in These Countries
13H5264	Bahamas, Barbados, Bermuda, Bolivia, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Korea (South), Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Thailand, Trinidad (West Indies), United States of America, Venezuela
14F0033	Abu Dhabi, Albania, Antigua, Bahrain, Brunei, Dubai, Fiji, Hong Kong, India, Ireland, Kenya, Kuwait, Macao, Malaysia, Nigeria, Oman, People's Republic of China, Qatar, Singapore, United Kingdom
13H5270	Austria, Belgium, Bulgaria, Chile, Czech Republic, Denmark, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Israel, Italy, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Switzerland, Turkey, former Yugoslavia
13H5273	Japan
13H5276	Argentina, Australia, New Guinea, New Zealand, Papua, Paraguay, Uruguay
13H5279	Bangladesh, Pakistan, South Africa, Sri Lanka

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For 3-pin power cords:

Note:
The grounded adapter is required for full MPRII compliance.

IBM Power Cord Part Number	Used in These Countries
25H2205	Argentina, Australia, New Guinea, New Zealand, Papua, Paraguay, Uruguay
25H2207	Bahamas, Barbados, Bermuda, Bolivia, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Korea (South), Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Trinidad (West Indies), United States of America, Venezuela
25H2209	Austria, Belgium, Bulgaria, Czech Republic, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Turkey, former Yugoslavia
25H2211	Denmark
25H2213	Bangladesh, Pakistan, South Africa, Sri Lanka
25H2215	Abu Dhabi, Albania, Antigua, Bahrain, Brunei, Dubai, Fiji, Hong Kong, India, Ireland, Kenya, Kuwait, Macao, Malaysia, Nigeria, Oman, People's Republic of China, Qatar, Singapore, United Kingdom
25H2219	Thailand
25H2221	Switzerland
25H2223	Chile, Italy
25H2225	Israel

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For 3-pin slim power cords:

IBM Power Cord P/N	Used in These Countries
76H3514	Argentina, Australia, Papua New Guinea, New Zealand, Paraguay, Uruguay
76H3516	Bahamas, Barbados, Bermuda, Bolivia, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Trinidad (West Indies), United States of America, Venezuela
76H3518	Austria, Belgium, Bulgaria, Czech Republic, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Turkey, former Yugoslavia
76H3520	Denmark
76H3522	Bangladesh, Pakistan, South Africa, Sri Lanka
76H3524	Abu Dhabi, Albania, Antigua, Bahrain, Brunei, Dubai, Fiji, Hong Kong, India, Ireland, Kenya, Kuwait, Macao, Malaysia, Nigeria, Oman, People's Republic of China, Qatar, Singapore, United Kingdom
76H3526	Japan
76H3528	Switzerland, Liechtenstein
76H3530	Chile, Italy, Ethiopia, Libya
76H3532	Israel
76H3535	Korea
76H4866	Thailand

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Read This First

Before you go to the checkout guide, be sure to read this section.

Important Notes

- **Only certified trained personnel should service the computer**.
- Read FRU service procedures before replacing any FRUs.
- **Be extremely careful during write operations such as copying, saving, or formatting.** Drives in the computer that you are servicing might have been rearranged or the drive startup sequence might have been altered. If you select an incorrect drive, data or programs can be written over.
- **Replace FRUs only for the correct model.** When you replace the FRU, make sure the model of the machine and FRU part number are correct by referring to the part list.
- **FRUs should not be replaced because of a single, unreproducible failure.** Single failures can occur from a variety of reasons that have nothing to do with a hardware defect such as: cosmic radiation, electrostatic discharge, or software errors. FRU replacement should be considered only when a recurring problem exists. If this is suspected, clear the error log and run the test again. Do not replace any FRUs if log errors do not reappear.
- **Be careful not to replace a nondefective FRU.**

How to Use Error Messages: Use the error codes displayed on the screen to diagnose failures. If more than one error code is displayed, begin the diagnosis with the first error code. The cause of the first error code can result in false error codes being displayed. If no error code is displayed, see if the error symptom is listed in the "Symptom-to-FRU Index" on page 223.

Port Replicator Problems: If you suspect a problem with the Port Replicator, see "Port Replicator Checkout" in the "Common Devices Checkout" section for more information.

How to Diagnose Multiple FRUs: If the adapter or device has more than one FRU, the error code could be caused by either FRU. Before replacing multiple FRUs, try removing or exchanging each FRU, one by one in the designated sequence, to see if the symptoms change.

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What to Do First: The servicer must include the following in the parts exchange form or part return form that is attached to the returned FRU:

___ 1. Name and phone number of servicer
___ 2. Date of service
___ 3. Date when part failed
___ 4. Date of purchase
___ 5. Failure symptoms, error codes appearing on display, and beep symptoms
___ 6. Procedure index and page number in which failing FRU was detected
___ 7. Failing FRU name and part number
___ 8. Machine type, model number, and serial number
___ 9. Customer's name and address

Before checking problems with the computer, determine whether the damage applies the warranty by referring to the following:

Note for Warranty: During the warranty period, the customer may be responsible for repair costs if the computer damage was caused by misuse, accident, modification, unsuitable physical or operating environment, or improper maintenance by the customer. The following list provides some common items that are not covered under warranty and some symptoms that may indicate the system was subjected to stresses beyond normal use:

The following is not covered under warranty:

- LCD panel cracked by applying excessive force or by being dropped
- Scratched (cosmetic) parts
- Cracked or broken plastic parts, broken latches, broken pins, or broken connectors caused by excessive force
- Damage caused by liquid spilled into the system
- Damage caused by improperly inserting a PCMCIA card or installation of an incompatible card
- Damage caused by foreign material in the FDD or UltraBay
- Diskette drive damage caused by pressing the diskette drive cover or inserting diskettes with multiple labels
- Damaged or bent diskette eject button
- CD-ROM drive damage caused by excessive forces shock, or by being dropped
- Fuses blown by attaching a nonsupported device
- Forgotten computer or hard disk password (making the computer or hard disk unusable)

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If the following symptoms are present, they may indicate damage caused by nonwarranted activity:

- Missing parts may be a symptom of unauthorized service or modification.
- HDD spindles can become noisy if subjected to excessive force or by being dropped.
- I9990303 errors can be caused by exposure to strong magnetic fields.

How to Disable the Power-On Password:

1. Power-off the computer.
2. Open the keyboard, and remove the diskette drive or CD-ROM drive and the battery pack.
3. Install a jumper on the power-on password connector on the left side of the FDD connector. (See "Power-On Password Connector" on page 345 for location.)
4. Reinstall the battery pack and the diskette drive/CD-ROM drive.
5. Power-on the computer and wait until the POST ends.
6. Verify that the password prompt does not appear.
7. After the service check is completed, remove the jumper.

To reactivate the password, set the password again.

Supervisor and Hard Disk Passwords: The supervisor password and the hard disk password (HDP) are security features that are used to protect the system and the hard disk data from unauthorized access. No overriding capability is provided. If only a hard disk password is set, obtaining permission from the password owner to unlock the password is a prerequisite for running diagnostic tests and performing service. If both supervisor password and hard disk password are set, you can enter Easy-Setup by pressing the **Enter** key or power-on password at the supervisor password prompt. In this case, the **Password**, **Start up**, and **Initialize** icons cannot be selected.

See "Password Combinations (POP, HDP, PAP)" on page 239 for more information about passwords.

Power Shutdown Switch: The power shutdown switch resets the system regardless of the microcode status and forces the power off. Use this push button to power-off when power is not completely off or the microcode is in a hung state.

See "Rear View" on page 342 for the power shutdown switch.

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Checkout Guide

Use the following procedure as a guide for computer problems.

Note: The diagnostic tests are intended to test only IBM products. Non-IBM products, prototype cards, or modified options can give false errors and invalid system responses.

1. Obtain the failing symptoms in as much detail as possible.
2. Verify the symptoms by attempting to re-create the failure by running the diagnostic test or by repeating the same operation.

   Note: To run the diagnostics, refer to "How to Run the Diagnostics" on page 237.

3. Use the following table with the verified symptom to determine which page to go to. Search the symptoms column and find the description that best matches your symptom; then go to the page shown in the "Go to" column.

Symptoms (Verified)	Go to
Power failure. (The power indicator does not go on or stay on.)	"Power Systems Checkout" on page 213.
POST does not complete. No beeps or error code are indicated.	"Symptom-to-FRU Index" on page 223, and then use the **No Beep Symptoms** table.
The configuration is not the same as the installed devices.	"Checking the Installed Devices List" on page 238.
POST beeps, but no error codes are displayed.	"Symptom-to-FRU Index" on page 223, and then use the **Beep Symptoms** table.
POST detected an error and displayed numeric error codes.	"Symptom-to-FRU Index" on page 223, and then use the **Numeric Error Codes** table.
The diagnostic test detected an error and displayed an FRU code.	"FRU Codes" on page 227.
Other symptoms (such as LCD display problems).	"Symptom-to-FRU Index" on page 223, and then use the other symptom table.
Symptoms cannot be re-created. (Intermittent problems.)	Use the customer reported symptoms and go to "Symptom-to-FRU Index" on page 223.

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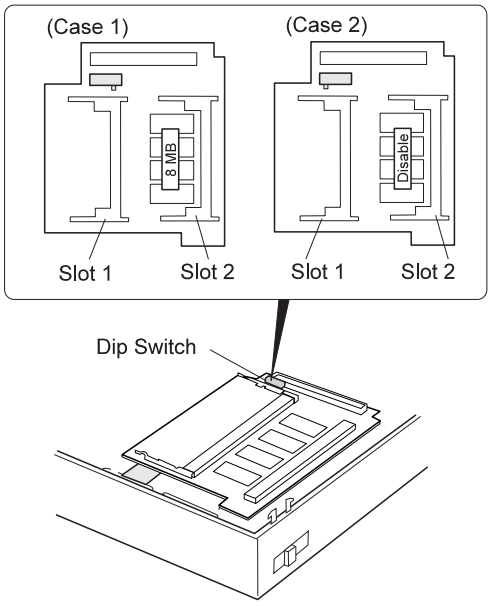
Memory Checkout

DIMMs are available for increasing memory capacity.

Note: Models 760XL and 760XD have a dip switch on the DIMM adapter card. When a 64 MB 2bank DIMM is installed, the dip switch is located to the left as case 2, and the base memory (8 MB) on the DIMM adapter card is disabled.

The 64MB 2 bank DIMM is accepted only in slot 2. If the card is installed in slot 1, the card will not be recognized as 64MB DIMM.



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Models 760C/760CD/760L/760LD

DIMM	Displayed Value
0MB	7808KB
8MB	16000KB
12MB	20096KB
16MB	24192KB
20MB	28288KB
24MB	32384KB
28MB	36480KB
32MB	40576KB

Models 760E/760ED/760EL/760ELD

DIMM	Base Memory 8MB	Base Memory 16MB
0MB	7808KB	16000KB
8MB	16000KB	24192KB
16MB	24192KB	32384KB
24MB	32384KB	40576KB
32MB	40576KB	48768KB
40MB	48768KB	56960KB
48MB	56960KB	65152KB
64MB	73344KB	81536KB

Models 760XL/760XD

Dip Switch	Slot 1	Slot 2	Total Memory	Displayed Value
Right	16MB	0MB	32MB	32384KB
		8MB	40MB	40576KB
		16MB	48MB	48768KB
		32MB	64MB	65152KB
	32MB	32MB	80MB	81536KB
Left	16MB	64MB	88MB	89728KB
	32MB	64MB	104MB	106112KB

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Memory errors might stop system operations, show error messages on the screen, or hang the system.

Use the following procedure to isolate memory problems:

Note: Make sure that the DIMM adapter card is fully installed into the connector. A loose connection can cause an error.

1. Power-off the computer and remove the DIMM adapter card from its slot (if installed).
2. Press and hold the **F1** key; then power-on the computer. Hold the **F1** key down until the Easy-Setup screen appears.
3. Select **Test** and press **Enter**.
4. Select **Memory** and press **Enter** to run the memory test on base memory. If an error appears, replace the system board.
5. Power-off the computer and reinstall the DIMM adapter card; then power-on the computer. Verify the memory size; then test the memory. If an error appears, replace the DIMM adapter card.

If memory problems occur intermittently, use the loop option to repeat the test. When the test detects an error, an error log is printed on the printer connected to the parallel port. See “Error Log” on page 238 for more information.

System Programs in Flash Memory: System setup programs and diagnostic tests are stored in flash memory.

Flash Memory Update: A flash memory update is required for the following conditions:

- New versions of system programs.
- New features or options are added.

To update the flash memory, do the following:

1. Get the appropriate diskette containing the update.
2. Insert the System Program Service Diskette into drive A and power-on the computer.
3. Select **Update system programs** from the menu.

System Board and CPU Card Checkout

The processing functions are performed by both the system board and the CPU card. Processor problems can be caused by either FRU. However, the CPU card generally has a lower probability of failure. When a numeric code calls the system board or the CPU card as a FRU, or the CPU card is called by a diagnostic test by showing FRU code 11, use the following procedure to isolate the problem:

1. Run the system board test to verify the symptom. This test verifies both the system board and the CPU card. If no error is detected, return to “Checkout Guide” on page 205.

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Note: Don't touch the keyboard and pointing device when the system board test is running. This may cause an unexpected error.

2. If FRU code 10 appears, replace the system board but do not replace the CPU card. Transfer the CPU card from the old system board to the new system board.
3. If FRU code 11 appears, reseat the CPU card.
4. Rerun the test to verify the fix.
5. If FRU code 11 remains, replace the CPU card.

If this procedure does not correct the problem, go to "Undetermined Problems" on page 235.

Keyboard and Auxiliary Input Device Checkout

Remove the external keyboard if the internal keyboard is to be tested.

If the internal keyboard does not work or an unexpected character appears, make sure that the flexible cable extending from the keyboard is correctly seated in the connector on the video card.

If the keyboard cable connection is correct, check the DSP card or Audio (ESS) card.

If the tests do not detect a keyboard problem, run the **keyboard test** by doing the following:

1. Go to the diagnostic menu screen by selecting **Test** in the Easy-Setup menu.
2. Press **Ctrl**+**A** to enter to the advanced diagnostic mode.
3. Press **Ctrl**+**K**; a layout of the keyboard appears on the screen.
4. Check that when each key is pressed, the key's position on the keyboard layout on the screen changes to a black square.

   Note: When the **Fn** key is pressed, a black square briefly appears.

If the tests detect a keyboard problem, do the following one at a time to correct the problem. Do not replace a nondefective FRU.

- Reseat the keyboard card cable.
- Replace the keyboard card cable.
- Replace the keyboard card assembly.
- Replace the video card.
- Replace the system board.

The following auxiliary input devices are supported for this computer:

- Numeric keypad
- Mouse (PS/2 compatible)

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- External keyboard (with keyboard/mouse cable)

If any of these devices do not work, reseat the cable connector and repeat the failing operation.

If the problem does not recur, recheck the connector.

If the problem is not corrected, replace the device, and then the system board.

DSP Card Checkout

(Models 760C/760CD/760E/760ED/760XD)

1. Go to the diagnostic menu screen by selecting **Test** in the Easy-Setup menu.
2. Select **DSP** and run the diagnostic tests.
3. If the test detects a DSP card problem, replace the DSP card.

Audio (ESS) Card Checkout

(Models 760L/760LD/760EL/760ELD/760XL)

1. Go to the diagnostic menu screen by selecting **Test** in the Easy-Setup menu.
2. Select **Audio** and run the diagnostic tests.
3. If the test detects a audio (ESS) card problem, replace the audio (ESS) card.

TrackPoint III Checkout

If the TrackPoint III does not work, check the configuration in the ThinkPad Features program. If the configuration of the TrackPoint III is disabled, select **Enable** to enable it.

If this does not correct the TrackPoint III problem, continue with the following.

The TrackPoint III does automatic compensations to adjust the pointer sensor. During this process, the pointer moves on the screen automatically for a short time. This self-acting pointer movement can occur when a slight, steady pressure is applied to the TrackPoint III pointer while the computer is powered on or while the system is running, or when readjustment is required because the temperature has exceeded its normal temperature range. This symptom does not indicate a hardware problem. No service actions are necessary if the pointer movement stops in a short period of time.

If a click button problem or pointing stick problem occurs, do the following:

1. Go to the Easy-Setup menu.
2. Select an item with the pointing stick.
3. Press either the left or right click button.
4. Verify that both buttons work correctly.

If either the pointing stick or the click button does not work, do the following actions one at a time to correct the problem. Do not replace a nondefective FRU.

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- Reseat the keyboard card cables.
- Replace the keyboard card cables.
- Replace the keyboard card assembly.
- Replace the video card.
- Replace the system board.

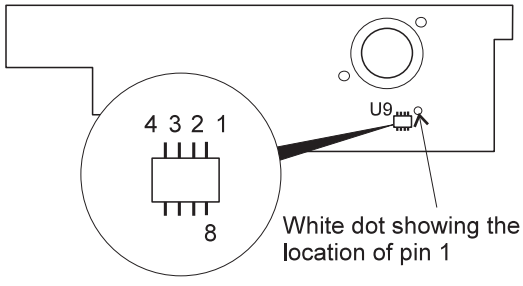
Fan Checkout (Models 760XL/760XD)

The cooling fan is controlled by a thermostat on the video card. Prior to checking the fan, confirm that the 760XL or 760XD passes the diagnostics. Refer to “How to Run the Diagnostics” on page 237.

Model 760XL: To check the fan, do the following:

1. Turn off the computer.
2. Remove the following FRUs (see “FRU Removals and Replacements” on page 246):
   a. Diskette drive/CD-ROM drive
   b. Battery pack
   c. Hard disk drive
   d. Top cover
   e. LCD unit
   f. Keyboard unit
   g. Rear IR
   h. System board assembly
   i. Upper shield
3. Attach the AC adapter to the system board assembly.
4. Find U9 on the video card. Then apply a short across pin 1 and pin 4 of U9 (LM56), and then turn on the computer.

(Video card top view)



Attention

Verify the location of pin 1 and pin 4. Pin 8 is for power control. **Do not touch pin 8**. Applying a short across pin 8 and another pin might damage the card.

5. Check the rotation of the fan.

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Model 760XD: The fan starts when the temperature of the inside box rises over 54°C, and stops when the temperature of the inside box falls under 49°C.

To check the fan, do the following:

1. Turn off the computer.
2. Do the following steps to warm the computer up so that the fan starts:
   a. Put the computer on a non-thermal-conductive material — for example, corrugated cardboard.
   b. Attach the AC adapter; then turn on the computer.
   c. Run the video function loop test of the diagnostics (see “How to Run the Diagnostics” on page 237)
   d. Close the LCD unit.

   The fan should start rotating within 30 minutes.
3. Check the air flow coming out from the fan louver.

Game Port Checkout

Do the following if a joystick problem occurs:

1. Connect the joystick to the game port.
2. Go to the Easy-Setup menu.
3. Select an item with the joystick.
4. Press any button of the joystick.
5. Verify that all buttons work correctly.

If either the joystick or a button does not work, replace the video card. If the problem persists, replace the system board.

Diskette Drive Test

Do the following to isolate the problem to a controller, drive, or diskette. A scratch, write enabled, nondefective 2HD diskette is required.

FDD-1 represents the the diskette drive in the UltraBay. FDD-2 represents the port replicator, expansion unit, or diskette drive attached through the external diskette drive connector.

Warning: Make sure that the diskette does not have more than one label attached to it. Multiple labels can cause damage to the drive or can cause the drive to fail.

Do the following to select the test device:

1. Select the advanced diagnostics mode and select **Tool**; then select **FDD-1** or **FDD-2** and press the **Spacebar**. A √ mark appears next to the selected icon. Insert the *blank* diskette when instructed.
2. Run the diskette drive test.
3. If the controller test detects an error, FRU code 10 appears. Replace the system board.

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4. If the controller test runs without errors, the drive read/write tests start automatically.
5. If the drive test detects an error, FRU code 50 for FDD-1; or 51 for FDD-2 appears. If the diskette itself is known to be good, replace the drive.
6. If FDD-2 test detects an error, move the drive to the computer's diskette drive connector directly, if possible, and test it again as FDD-1.

   If no errors occur in the FDD-1 position, the drive is not defective. Go to “Port Replicator Checkout” in “Common Devices Checkout” section to isolate the replicator problem.
7. If the drive is attached through an Expansion Unit, go to the service manual of the Expansion Unit to isolate the problem.
8. If the drive is attached through a Diskette Drive Attachment Unit, replace the unit.

If an error occurs when the external diskette drive is attached through the external diskette drive connector and there is not a diskette drive in the UltraBay, reseat the connector on the video card. If the error still remains, reseat the external diskette drive connector. If the error still remains, replace the following FRUs one at a time:

1. External diskette drive kit
2. Video card
3. External diskette drive connector

LCD Information Panel Checkout

If an LCD information panel problem occurs, do the following:

1. Power-off the computer.
2. Power-on the computer.
3. All the icons in the LCD information panel appear for a moment soon after the computer is powered-on. Verify that all icons appear correctly.

   If some of the icons do not appear, replace the keyboard.

If the problem still remains, replace the video card.

Power Systems Checkout

To verify the symptom of the problem, power-on the computer using each of the power sources as follows:

1. Remove the battery pack, diskette drive, and hard disk drive.
2. Connect the AC Adapter and check that power is supplied.
3. Install the diskette drive or hard disk drive one at a time, and check that power is supplied from each power source.

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4. Disconnect the AC Adapter, remove the hard disk and diskette drive, and install the charged battery pack; then check that power is supplied by the battery pack.

If you suspect a power problem, see the appropriate power supply check in the following list:

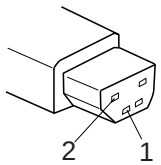
- "Checking the AC Adapter."
- "Checking Operational Charging" on page 215.
- "Checking the Battery Pack" on page 215.
- "Checking the Car-Battery Adapter" on page 216.
- "Checking the Backup Battery" on page 217.
- "Checking the Standby Battery" on page 218.
- "Port Replicator Power Overload" on page 222.

Checking the AC Adapter: You are here because the computer fails only when the AC Adapter is used.

- If the power problem occurs only when the port replicator is used, replace the replicator.
- If the power-on indicator does not turn on, check the power cord of the AC Adapter for correct continuity and installation.
- If the operational charge does not work, go to "Checking Operational Charging" on page 215.

Note: For Model 760CD, 760ED, 760LD, 760ELD, 760XL, and 760XD, there are two types of adapters. The procedure for checking both types is the same.

1. Unplug the AC Adapter cable from the computer and measure the output voltage at the plug of the AC Adapter cable. See the following figure:



(20 - 10 V)

Pin	Voltage (V dc)
1	+18.0 to +21.0
2	Ground

(16 - 10 V)

Pin	Voltage (V dc)
1	+14.5 to +17.0
2	Ground

- If the voltage is correct, make sure the connection between DC/DC card and system board is not loose.

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- Replace the DC/DC card.
- If the problem is not corrected, replace the system board.
- If the problem is still not corrected, go to "Undetermined Problems" on page 235.
- If the voltage is not correct, go to the next step.

2. Unplug the AC Adapter cable from the ac power outlet and wait five minutes or longer to allow the over-voltage protection circuit to be fully discharged and initialized.
3. Plug the AC Adapter cable into the ac power outlet.
4. Measure the output voltage of the AC Adapter.
5. If the voltage is still not correct, replace the AC Adapter.

Note: An audible noise from the AC Adapter does not always indicate a defective adapter.

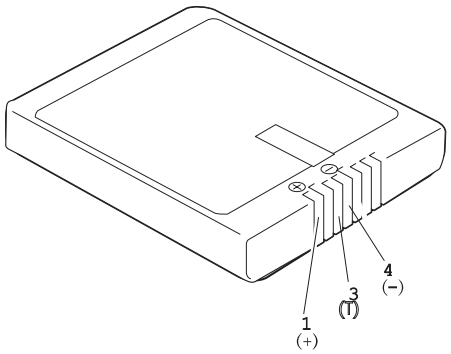
Checking Operational Charging: To check operational charging, use a discharged battery pack or a battery pack that has less than 50% of the total power remaining when installed in the computer.

Perform operational charging. If the battery status indicator does not turn on, remove the battery pack and leave it to return to room temperature. Reinstall the battery pack. If the charge indicator still does not turn on, replace the battery pack.

Checking the Battery Pack: Battery charging will not start until the Fuel-Gauge shows that less than 95% of the total power remains; with this condition the battery pack will charge to 100% of its capacity. This protects the battery pack from being overcharged or having a shortened life.

Do the following:

1. Power-off the computer.
2. Remove the battery pack and measure the voltage between battery terminals 1 (+) and 4 (–). See the following figure:



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Terminal	Voltage (V dc) / Signal
1	**+0 to +13.5**
2	Send
3	**Thermal**
4	**Ground (–)**
5	Select

Note: Signal lines, not used in these steps, are used for communication between the system and the battery.

3. If the voltage is less than +11.0 V dc, the battery pack has been discharged. Recharge the battery pack.

   If the voltage is still less than +11.0 V dc after recharging, replace the battery.

   Note: If the voltage of the battery pack is 0 V, it is not defective.

4. If the voltage is more than +11.0 V dc, measure the resistance between battery terminals 3 and 4. The resistance must be 4 to 30 K ohm.

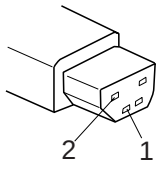
   If the resistance is not correct, replace the battery pack.

   If the resistance is correct, replace the DC/DC card.

Checking the Car-Battery Adapter

1. Unplug the Car-Battery Adapter cable from the computer.
2. Plug the Car-Battery Adapter into the cigarette lighter socket.

   Note: If the adapter is already plugged in, reseat it.
3. Measure the output voltage of the Car-Battery Adapter cable. See the following figure:



Pin	Voltage (V dc)
1	+19.0 to +21.0
2	Ground

- If the voltage is correct, the Car-Battery Adapter is working correctly. Check that the computer runs with the AC Adapter. If it runs correctly with the AC Adapter, check the system board. If the problem still remains, replace the following FRUs one at a time.

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a. DC/DC card
b. System board

If the problem is not resolved when the system board is replaced, go to "Undetermined Problems" on page 235.

- If the voltage is outside the normal voltage range, do one of the following:
  - Try these test procedures in a different car, if one is available.
  - Replace the Car-Battery Adapter if the computer works correctly with the AC Adapter.

Note: If the output voltage from the cigarette lighter socket of the car is less than 10.5 V dc, a continuous noise may be heard. The condition of the car battery should be checked by appropriate service personal.

Checking the Backup Battery

1. Power-off the computer and unplug the AC Adapter from the computer.
2. Open the keyboard, and remove the diskette drive/CD-ROM drive, the battery pack, and the hard disk drive.
3. Remove the top cover and keyboard unit.
4. Open the keyboard unit; then remove the keyboard card.
5. Remove the backup battery from the keyboard card. (Refer to "1200 Backup Battery, Speaker, Standby Battery" on page 288 to remove the battery.)
6. Measure the voltage of the backup battery. See the following figure:

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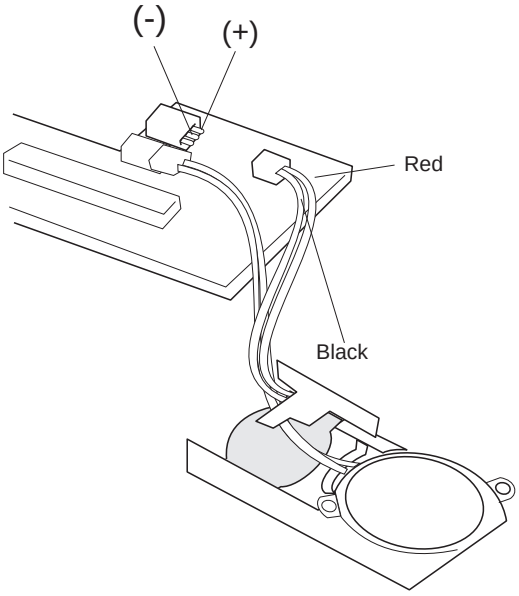

Wire	Voltage (V dc)
Red	+2.5 to +3.7
Black	Ground

- If the voltage is correct, replace the system board.
- If the voltage is not correct, the backup battery has been discharged. Replace the backup battery.
- If the backup battery discharges quickly after replacement, replace the system board.

Checking the Standby Battery

1. Power-off the computer and unplug the AC Adapter from the computer.
2. Open the keyboard, and remove the diskette drive/CD-ROM drive, the battery pack, and the hard disk drive.
3. Remove the top cover and keyboard unit.
4. Open the keyboard unit; then remove the keyboard card.
5. Remove the standby battery from the keyboard card. (Refer to “1200 Backup Battery, Speaker, Standby Battery” on page 288 to remove the battery.)

Warning: Be careful not to cause a short circuit when measuring the voltage.

6. Measure the voltage of the standby battery.
   - If the voltage between red and black is 3.5 V dc or greater, the voltage is correct. Go to step 12 on page 219 to verify standby battery operation.

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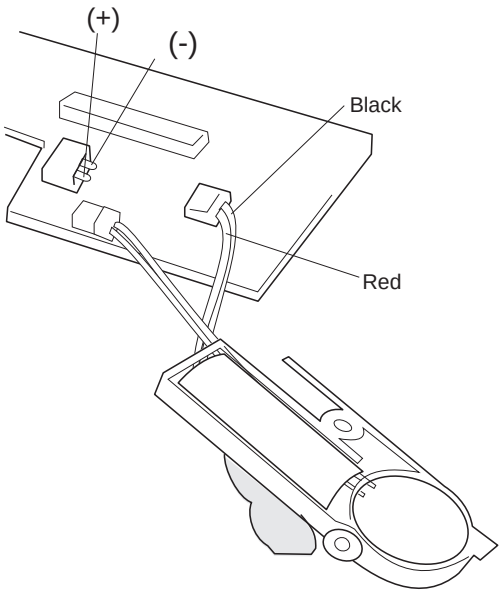
- If the voltage is less than 3.5 V dc, go to the next step.

7. Plug the AC Adapter into the computer and power-on the computer.

Warning: Be careful not to cause a short circuit when measuring the voltage.

8. Measure the output voltage at the connector on the system board.



Pin	Voltage (V dc)
+	+4.0
–	Ground

- If the voltage is less than +4.0 V dc, replace the DC/DC card. If the voltage is still low, replace the system board.
- If the voltage is more than +4.0 V dc, power-off the computer, replace the standby battery, and go to the next step.

9. Ensure that the AC Adapter is plugged into the computer; then power-on the computer.
10. Charging of the standby battery starts. A depleted battery needs approximately 30 minutes to be recharged to the operational voltage of +3.5 V dc.
11. Unplug the AC Adapter.
12. Verify the standby battery function by removing and installing the battery pack during suspend mode.

    Note: Removing and installing the battery pack during suspend mode should be done within

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one minute. The resume operation must start. If the resume operation does not work, switching of power from the battery pack to standby battery will not be correct. Replace the DC/DC card.

If replacing the DC/DC card does not resolve the problem, replace the system board.

Power Management Features

Three power management modes are provided by the computer to reduce power consumption and prolong battery power.

Standby Mode: When in standby mode the following occurs:

- The LCD backlight turns off.
- The hard disk motor stops.

Events that cause the computer to enter standby mode:

- Standby requested by the **Fn** key (**Fn**+**F3**).
- No activity under **auto-standby** enabled by the ThinkPad Features program.

Events that cause the computer to exit or resume standby mode:

- (Resume) Any key operation.

Suspend Mode: When in suspend mode, the following, in addition to the four actions of standby mode, occur:

- The LCD is powered off.
- The hard disk is powered off.
- The CPU is stopped.

Notes:

1. In the ThinkPad Features program, the computer can be set to “Will not suspend even if LCD is closed”.
2. In the ThinkPad Features program, the computer can be set to “suspend hibernate while docked.”
3. When the computer is powered with ac power and is used with one of the communication PC cards, the computer enters *standby mode*; the PC card and application program remain active.
4. In the following conditions, the computer cannot enter suspend mode:
   - While a communication link is running.
   - While the computer is attached to a Dock I.

Events that cause the computer to enter suspend mode:

- Suspend mode is requested by the **Fn** key (**Fn**+**F4**).
- The LCD is closed.

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- The keyboard is opened.
- The specified time has elapsed from the last operation with the keyboard, mouse, hard disk drive, parallel connector, or diskette drive; or the AC Adapter is plugged in. The time is specified by ***Suspend Timer*** in the ThinkPad Features program.
- The battery condition is low. The battery power indicator blinks orange.
- In the ThinkPad features program, the computer can be set to “Hibernate when battery becomes low.” The default setting is suspend.
- Either the *PS2 OFF* or *PS2 SUSpend* command is set in the ThinkPad Features program.

Events that cause the computer to exit or resume suspend mode:

- (Resume) The LCD is opened.
- (Resume) The keyboard is closed.
- (Resume) The real time clock alarm is signaled.
- (Resume) The ring indicator (RI) is signaled by a serial or PCMCIA device.
- (Resume) The **Fn** key is pressed.
- (Resume) An external keyboard key is pressed while operating with ac power.
- (Exit) Timer conditions are satisfied for entering hibernation mode.

Hibernation Mode: When in hibernation mode, the following occurs:

- The system status, RAM, VRAM, and setup data are stored on the hard disk.
- The system is powered off.

Notes:

1. In the ThinkPad Features program, the computer can be set to “suspend hibernate while docked.”
2. The computer cannot enter hibernation mode when:
   - It is powered with ac power and a communication PC card is used.
   - The computer is attached to a DOCK I.

Any of the following events can cause the computer to enter hibernation mode:

- Hibernation mode is requested by the **Fn** key (**Fn**+**F12**).
- Timer conditions are satisfied in suspend mode.
- A critical low battery condition occurs.
- The `PS2 HIBernation` command is set in the ThinkPad Features program.

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The following event causes the computer to exit hibernation mode:

- The power-on switch is turned on.

When power is turned on, the hibernation history in the boot record on the hard disk is recognized and system status is restored from the hard disk to resume operation.

Port Replicator Power Overload: If power shutdowns occur intermittently when using PCMCIA-2 devices via a port replicator, suspect a current overload. Some PCMCIA devices use much power; if the maximum usage of each device occurs simultaneously, the total current will exceed the limit, thereby causing a power shutdown. Isolate this problem by removing one of the devices, and use the computer under the same condition to see whether a power shutdown occurs. Do this procedure for all devices; then determine the cause.

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Symptom-to-FRU Index

The Symptom-to-FRU Index lists the symptoms and errors and the possible causes. The most likely cause is listed first.

Note: Perform the FRU replacement or actions in the sequence shown in the "FRU/Action in Sequence" column. If a FRU did not solve the problem, put the original part back in the computer. Do not replace a nondefective FRU.

This index can also be used to help you decide which FRUs to have available when servicing a computer.

Numeric error codes show the errors detected in POST or system operation. In the following error codes, **X** can be any number.

If no codes are available, use narrative symptoms.

If the symptom is not listed, go to "Undetermined Problems" on page 235.

> **Note:** For IBM devices not supported by diagnostic codes in the ThinkPad notebook computers, see the manual for that device.

Numeric Error Codes

Symptom / Error	FRU / Action in Sequence
10X • 101: Interrupt failure. • 102: Timer failure. • 103: Timer interrupt failure. • 104: Protected mode failure. • 105: Last 8042 command not accepted. • 107: NMI test failure. • 108: Timer bus test failure. • 109: Low meg-chip select test.	1. **System board**
110 (System board parity.)	1. **Go to "Memory Checkout" on page 206.** 2. DIMM Adapter Card and DIMM 3. The computer is attached to the expansion unit. 4. System board

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Symptom / Error	FRU / Action in Sequence
111 (I/O parity.)	1. **Go to "Memory Checkout" on page 206.** 2. Expansion Unit/Port Replicator 3. System board
158 (HDP was not set even though the supervisor password is set.)	1. Set HDPs for both hard disk drives in the HDD bay and the UltraBay.
159 (HDP is not set the same as the supervisor password.)	1. Set correct HDPs for both hard disk drives in the HDD bay and the UltraBay.
161 (Dead battery.)	1. **Go to "Checking the Backup Battery" on page 217.** 2. Backup battery 3. System board
163 (Time and date were not set.)	1. **Reseat the keyboard connector on the video card.** 2. Set time and date. 3. System board
173 (Configuration data was lost.)	1. **Reseat the keyboard connector on the video card.** 2. Select OK in the error screen; then set the time and date. 3. Backup battery 4. System board
174 (Configuration error: Perform"Checking the Installed Devices List" on page 238 before changing any FRUs.)	1. **Check device configuration.** 2. System board 3. Diskette drive assembly 4. Hard disk drive assembly
175, 177, 178 • 175: EEPROM CRC #1 error. • 177: Supervisor password check sum error. • 178: EEPROM is not functional.	1. **System board**
183 (Incorrect password entered at the supervisor password prompt.)	1. **Have the user examine the password.**
184 (POP check sum error.)	1. **Reset the POP (power-on password) in Easy-Setup.**

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Symptom / Error	FRU / Action in Sequence
185 (The startup sequence is not valid. Suspect that power was off when the startup sequence was being updated.)	1. **Reset the startup sequence in Easy-Setup.**
186	1. **System board**
188 (EEPROM CRC #2 error.)	1. **Set the system identification using the ThinkPad Hardware Maintenance Diskette.**
190 (Depleted battery pack was installed when the power was on.)	1. **Go to "Checking the Battery Pack" on page 215.**
191XX (PM initialization error.)	1. **System board** 2. CPU card
195 (The configuration read from the hibernation area does not match the actual configuration.)	1. **Check if the configuration was changed.** For example, check if the disk drive is from another computer.
196 (Read error occurred in the hibernation area of the HDD.)	1. **Run the hard disk drive test.** 2. Hard disk drive
1XX	1. **System board**
2XX • 201: Memory data error. • 202: Memory line error 00–15. • 203: Memory line error 16–23. • 205: Memory test failure on on-board memory. • 221: ROM to RAM remap error.	1. **Go to "Memory Checkout" on page 206.** 2. DIMM, or DIMM Adapter 3. System board
301, 303, 304, 305, 3XX (301: Keyboard error.)	1. **Go to "Keyboard and Auxiliary Input Device Checkout" on page 209.** 2. Keyboard 3. Video card 4. External numeric keypad 5. External keyboard 6. Keyboard/mouse cable 7. System board

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Symptom / Error	FRU / Action in Sequence
601, 6XX (601: Diskette drive or controller error.)	1. **Go to "Diskette Drive Test" on page 212.** 2. Diskette drive assembly 3. Diskette 4. System board
602 (Diskette read error.)	1. **Go to "Diskette Drive Test" on page 212.** 2. Diskette 3. Diskette drive assembly
604 (Unacceptable ID was read from the diskette drive.)	1. **Go to "Diskette Drive Test" on page 212.** 2. Diskette drive assembly 3. System board
11XX 1101: Serial_A test failure.	1. **Serial device** 2. Communication cable 3. System board
17XX • 1701: Hard disk controller failure. • 1780, 1790: Hard disk 0 error. • 1781, 1791: Hard disk 1 error.	1. **Hard disk drive** 2. System board
24XX (2401: System board video error.)	1. **System board** 2. Video card
808X • 8081: PCMCIA presence test failure. (PCMCIA revision number also checked.) • 8082: PCMCIA register test failure.	1. **PCMCIA slot assembly** 2. PCMCIA device 3. System board
860X (Pointing device error when TrackPoint III is disabled.) • 8601: System bus error.–8042 mouse interface. • 8602: External mouse error. • 8603: System bus error or mouse error.	1. **External mouse** 2. External keyboard 3. System board

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Symptom / Error	FRU / Action in Sequence
861X (Pointing device error when TrackPoint III is enabled.) • 8611: System bus error.–I/F between 8042 and IPDC. • 8612: TrackPoint error. • 8613: System board or TrackPoint error.	1. **Reseat the keyboard connector on the video card.** 2. Reseat the keyboard TrackPoint III cable on the keyboard card. 3. Keyboard 4. External mouse 5. Video card 6. System board
I9990301 **I9990302** **I9990305** • I9990301: Hard disk error. • I9990302: Invalid hard disk boot record. • I9990305: No bootable device.	1. **Check that the operating system is installed in the HDD. Install the operating system if it is not installed.** 2. Reseat the boot device. 3. Check the startup sequence for the correct boot device. 4. Check that the operating system has no failure and is installed correctly.
I9990303 (Bank–2 flash ROM check sum error.)	1. **System board**
Other codes not listed above	1. **Go to "Undetermined Problems" on page 235.**

FRU Codes

If an error is detected by the diagnostic tests, a *four-digit* FRU code is displayed. The FRU code indicates two suspected FRUs. Replace the FRU that is indicated by the *two leftmost digits* first; then replace the FRU indicated by the *two rightmost digits*. No FRU is assigned to code 00. If only one FRU is suspected, the other FRU code is filled with zeros. See the page referred to before replacing the FRU.

FRU Code	FRU/Action
10	System board
11	CPU card
15	Audio card (ESS)
16	DSP card
17	Front IR unit
18	Rear IR unit
20	Memory (See "Memory Checkout" on page 206.)
30	Reserved

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FRU Code	FRU/Action
32	External keyboard
33	External mouse
40	LCD assembly
42	Video card
45	External CRT
50	1. Reseat the drive (FDD-1) 2. Diskette drive (FDD-1)
51	1. Reseat the diskette drive (FDD-2) 2. Diskette drive (FDD-2)
60	1. Reseat the hard disk drive (HDD-1) 2. Hard disk drive (HDD-1)
61	1. Reseat the hard disk drive (HDD-3) 2. Hard disk drive (HDD-3)
62	1. Reseat the hard disk drive in the UltraBay (HDD-2) 2. Hard disk drive in the UltraBay (HDD-2)
63	1. Reseat the hard disk drive (HDD-4) 2. Hard disk drive (HDD-4)
70	PCMCIA-2 (replicator)
71	PCMCIA (under UltraBay)
72	PCMCIA slot assembly
90	CD-ROM drive
91	External CD-ROM drive

Note: The device ID and error codes are used to indicate the detail portion of the FRU which caused the error. If replacing a FRU does not correct a problem, see the device ID or error code from the previous failure. If they have changed, the cause might be because the new FRU is defective or that the FRU was incorrectly installed.

If the problem remains after replacement of the FRUs, go to “Undetermined Problems” on page 235.

Beep Symptoms

Symptom / Error	FRU / Action in Sequence
Continuous beeps.	**System board**
One beep and a blank, unreadable, or flashing LCD.	1. **Reseat the LCD connector**. 2. LCD assembly 3. Video card 4. System board 5. DC/DC card
One beep, and the message “Unable to access boot source.”	1. **Boot device** 2. System board

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Symptom / Error	FRU / Action in Sequence
One long, two short beeps and a blank or unreadable LCD.	1. **System board** 2. Video card 3. LCD assembly
One long beep followed by four short beeps each time the power switch is operated. (System cannot power-on due to low battery voltage.)	**Connect the AC Adapter or install a fully charged battery.**
One beep every second. (System is shutting down due to low battery voltage.)	**Connect the AC Adapter or install a fully charged battery (allows system to complete shutdown before changing the battery).**
Two short beeps with error codes.	**POST error. See "Numeric Error Codes" on page 223.**
Two short beeps with blank screen.	**System board**

No Beep Symptoms

Symptom / Error	FRU / Action in Sequence
No beep, power-on indicator not on, and a blank LCD during POST.	1. **Go to "Power Systems Checkout" on page 213.** 2. System board 3. DC/DC card 4. Power sources
No beep, power-on indicator on, and a blank LCD during POST.	1. **System board** 2. DC/DC card 3. CPU card
No beep, power-on indicator on, and a blinking cursor only during POST.	1. **System board** 2. CPU card 3. DC/DC card
No beep during POST but system runs correctly.	1. Turn the volume up and check the speaker. 2. **Check whether the DSP card or Audio (ESS) card connector is loose and reseat the connector.** 3. Speaker 4. DSP card/audio (ESS) card 5. DC/DC card

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LCD-Related Symptoms

Important

The LCD for the notebook computer contains over 921,000 thin-film transistors (TFTs). A small number of missing, discolored, or lighted dots (on all the time) is characteristic of TFT LCD technology, but excessive pixel problems can cause viewing concerns. The LCD should be replaced if the number of missing, discolored, or lighted dots in any background is 21 or more.

Symptom / Error	FRU / Action in Sequence
No beep, power-on indicator on, and a blank LCD during POST.	1. **System board** 2. DC/DC card 3. Video card 4. CPU card
• LCD backlight not working, or • LCD too dark, or • LCD brightness cannot be adjusted, or • LCD contrast cannot be adjusted.	1. **Reseat the LCD connectors.** 2. LCD assembly 3. DC/DC card
• LCD screen unreadable, or • Characters missing pels, or • Screen abnormal, or • Wrong color displayed.	1. **See important note for "LCD-Related Symptoms."** 2. Reseat all LCD connectors. 3. LCD assembly 4. System board 5. Video card
LCD has extra horizontal or vertical lines displayed.	**LCD assembly**

Keyboard/TrackPoint III-Related Symptoms

Symptom / Error	FRU / Action in Sequence
Keyboard (one or more keys) does not work.	1. **Reseat the keyboard connector on the video card.** 2. Reseat the three keyboard cables on the keyboard card. 3. Keyboard 4. Video card 5. System board

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Symptom / Error	FRU / Action in Sequence
TrackPoint III does not work.	1. **Reseat the keyboard connector on the video card.** 2. Go to "TrackPoint III Checkout" on page 210. 3. Keyboard 4. Video card 5. System board
Pointer moves automatically or does not work correctly.	1. **See "TrackPoint III Checkout" on page 210.**

Indicator-Related Symptoms

Symptom / Error	FRU / Action in Sequence
Indicator incorrectly remains off or on, but system runs correctly.	1. **Reseat the LCD connector on the video card**. 2. LCD assembly 3. Video card 4. System board

LCD Information Panel-Related Symptoms

Symptom / Error	FRU / Action in Sequence
An icon in the LCD information panel remains off or on, but the system runs correctly.	1. **Reseat the keyboard cable in the video card connector**. 2. Reseat the LCD information panel cable connectors in the keyboard. 3. Keyboard 4. Video card 5. System board

Power-Related Symptoms

Symptom / Error	FRU / Action in Sequence
Power shuts down during operation.	1. **Go to "Power Systems Checkout" on page 213.** 2. Battery pack 3. Remove the battery pack and let it cool for 2 hours. 4. DC/DC card 5. Power sources

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Symptom / Error	FRU / Action in Sequence
The system will not power-off. (See “Power Shutdown Switch” on page 204.)	1. **Press the power shutdown switch.** 2. System board

Function/Audio-Related Symptoms

Symptom / Error	FRU / Action in Sequence
The system will not suspend or resume by opening or closing the keyboard.	1. **Go to “Suspend Mode” on page 220 and check that the computer can enter suspend mode.** 2. Boot an operating system and press **Fn**+**F4**. If the computer enters suspend mode, suspect that the application program is not working properly. 3. Keyboard card 4. Video card 5. System board
The system will not suspend or resume by opening or closing the LCD.	1. **Go to “Suspend Mode” on page 220, and check that the computer can enter suspend mode.** 2. Boot an operating system and press **Fn**+**F4**. If the computer enters suspend mode, suspect that the application program is not working properly. 3. LCD assembly 4. Video card 5. System board
Battery fuel gauge does not go higher than 90%.	**Go to “Checking the Battery Pack” on page 215 and see the note.**
Memory count (size) appears different from actual size.	**Go to “Memory Checkout” on page 206.**
System configuration does not match the installed devices.	**Go to “Checking the Installed Devices List” on page 238.**
System hangs intermittently.	**Go to “Intermittent Problems” on page 234.**

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DSP-Related Symptoms

Symptom / Error	FRU / Action in Sequence
In OS/2, DOS, or Windows multimedia programs, no sound comes from the computer. (Only system beeps are heard at power-on.)	1. **Reseat the DSP card.** 2. Go to "DSP Card Checkout" on page 210 and check the DSP card. 3. Check that the device driver is installed correctly.
In OS/2, DOS, or Windows, the modem does not work.	1. **Check that the DSP Modem is active.** ***OS/2 and Windows:*** Click the **DSP Modem** icon in the ThinkPad Feature program. ***DOS:*** Run the MWMODEM ON command. 2. Reseat the DAA module.

ESS-Related Symptoms

Symptom / Error	FRU / Action in Sequence
In OS/2, DOS, or Windows multimedia programs, no sound comes from the computer. (Only system beeps are heard at power-on.)	1. **Reseat the audio (ESS) card.** 2. Go to "Audio (ESS) Card Checkout" on page 210 and check the audio (ESS) card. 3. Check that the device driver is installed correctly.

Peripheral-Device-Related Symptoms

Symptom / Error	FRU / Action in Sequence
External display does not work correctly.	1. **See "External Display Self-Test" in "Common Devices Checkout" section.**
Printer problems.	1. **Run printer self-test**. 2. Parallel port device 3. Cable 4. System board
Serial or parallel port device problems.	1. **Device** 2. Device cable 3. System board

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Infrared-Related Symptoms

Symptom / Error	FRU / Action in Sequence
Unable to communicate using the Infrared (IR) Port.	1. **Make sure the setup for the IR is correct.** 2. Make sure there are no fluorescent lights near the computer. The computer may receive optical noise from the fluorescent light. 3. Reseat the IR unit. 4. Run the advanced diagnostic test. If an error occurs and a FRU code is displayed, replace the parts shown by the FRU code.

Other Symptoms

Symptom / Error	FRU / Action in Sequence
Errors occur only when Port Replicator is used.	**See "Port Replicator Checkout" in the "Common Devices Checkout" section.**
PCMCIA slot pin is damaged.	**PCMCIA slots assembly**

Note: If you cannot find a symptom or error in this list and the problem remains, see "Undetermined Problems" on page 235.

Intermittent Problems

Intermittent system hang problems can be caused by a variety of reasons that have nothing to do with a hardware defect, such as cosmic radiation, electrostatic discharge, or software errors. FRU replacement should only be considered when a recurring problem exists.

When analyzing the intermittent problem, do the following:

1. Run the advanced diagnostic test for the system board in loop mode at least 10 times.
2. If no error is detected, do **not** replace any FRUs.
3. If any error is detected, replace the FRU shown by the FRU code. Rerun the test to verify that there are no more errors.

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Undetermined Problems

You are here because the diagnostic tests did not identify which adapter or device failed, installed devices are incorrect, a short circuit is suspected, or the system is inoperative. Follow the procedures below to isolate the failing FRU (do not isolate nondefective FRUs).

Verify that all attached devices are supported by the computer.

Verify that the power supply being used at the time of the failure is operating correctly. (See "Power Systems Checkout" on page 213.)

1. Power-off the computer.
2. Check the cables, wires, and connectors for short circuits and open circuits. Visually check them for damage. If any problems are found, replace the FRU.
3. Remove or disconnect all of the following devices:
   a. Non-IBM devices
   b. Devices attached to the expansion bus connector
   c. Printer, mouse, and other external devices
   d. Battery pack
   e. Hard disk drive
   f. Diskette drive/CD-ROM drive or the device attached in the UltraBay.
   g. DIMM
   h. PC Cards
4. Power-on the computer.
5. Determine if the problem has changed.
6. If the problem does not occur again, reconnect the removed devices one at a time until you find the failing FRU.
7. If the problem remains, replace the following FRUs one at a time. Do not replace a nondefective FRU.
   - DC/DC card
   - Video card
   - Keyboard card
   - LCD assembly
   - System board
   - DSP card or audio (ESS) card
   - CPU card

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Related Service Procedures

This section provides information about the following:

- “Status Indicators”
- “How to Run the Diagnostics” on page 237
- “Error Log” on page 238
- “Checking the Installed Devices List” on page 238
- “Password Combinations (POP, HDP, PAP)” on page 239
- “How to Run a Low-Level Format” on page 239
- “PC Test Card LED” on page 239
- “Fn Key Combinations” on page 240

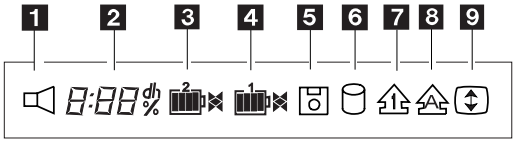
Status Indicators

The system status indicators show the current computer status in different colors (green, yellow, and orange).

Symbol	Color	Meaning
	Green	Battery fully charged
	Orange	Battery charging
	Blinking orange	Battery needs charging
	Green	Computer is in suspend mode
	Blinking Green	Computer is entering suspend mode or hibernation mode, or is resuming normal operation
	Green	Power on

LCD Information Panel

The LCD information panel shows the current computer status using these icons:



Icon	Meaning
1	Speaker

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Icon	Meaning
2	Remaining battery
3	Secondary battery status
4	Main battery status
5	Diskette drive in-use
6	Hard disk in-use
7	Numeric lock
8	Caps lock
9	Scroll lock

How to Run the Diagnostics

Use either the TrackPoint III or the cursor move keys to interact with the tests. The **Enter** key works the same as selecting the **OK** icon to reply OK.

1. Press and hold the **F1** key; then power-on the computer. Hold the **F1** key down until the Easy-Setup screen appears.
2. Select **Test** and press **Enter**.
3. Select a device and press **Enter** to run the test.
4. The test progress screen appears.
5. "OK" appears when the test ends without any errors.
6. Start the Advanced Diagnostic test by pressing **Ctrl**+**A** on the basic diagnostic menu screen.
7. Select **Tool** to install the tools.

Note: The following tools are required.

FDD:	Erasable 2HD diskette
Parallel:	Wrap plug (P/N 72X8546)
Serial:	Wrap plug (P/N 72X8546)
PCMCIA:	PC Test Card (P/N 35G4703)
CDROM:	Any CD (data CD is recommended)

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8. Select a device, press the **Spacebar**, and install the tool. Multiple devices can be selected by repeating this step.

   A √ mark appears beside the selected devices.
9. Select **OK** and press **Enter** if the selection is OK.
10. Select a device and press **Enter** to start the tests.

    Note: Don't touch the keyboard and pointing device when the system board test in running. This may cause an error.
11. Select **Test All** to test all devices.
12. Select **Loop Test** to run the tests in a repeated loop.

    A loop option menu appears where you can select a device loop or all-device loop. Select a device by pressing the **Spacebar**. Repeat this step to select multiple devices. Press **Enter** to start the diagnostic loop. If no device is selected, all device tests are looped.
13. To exit the loop, keep pressing **Ctrl**+**Pause** until the test exits. A beep sounds to notify that the exit interrupt is sensed by the test program.

Error Log

Diagnostic errors are printed on the printer that is attached to the parallel port when the error is detected. The error is also logged in the system memory.

Do the following to display the errors.

1. End the test, if it is running.
2. Press **Ctrl**+**A** to select the advanced diagnostic mode.
3. Press **Ctrl**+**E**.
4. The error log appears.
5. To exit the screen, select the cancel icon or press **Esc**.

The error log is not saved when the system is powered-off.

Checking the Installed Devices List

If a device is installed but the icon appears in a gray shade rather than a dark shade on the basic diagnostics screen, the device is defective. Reseat the device connectors. If the symptom remains, replace the device or the system board. If needed, adjust the contrast control to clearly distinguish the shades of the icon.

If a device that is not installed appears in a dark shade (for example, FDD-2 appears in a dark shade when *no* second FDD is installed), do the following:

1. Replace the **first** device in the configuration, such as an FDD-1, an HDD-1, or a PCMCIA-1.
2. If the problem remains, replace the system board.

The PCMCIA-1, Parallel, and Serial icons are always displayed in a dark shade because the icons represent

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subsystems of the system board and not the attachment of the devices.

The FDD-1, HDD-1, or PCMCIA-1 icons represent the **first** drive in the system configuration for each type of device. Similarly, the FDD-2 or PCMCIA-2 icons represent the **second** drive, usually attached through a port replicator or an expansion unit. The HDD-2 icon represents the hard disk drive in the UltraBay. The HDD-3 and HDD-4 icons represent the hard disk drive, attached through an expansion unit.

Password Combinations (POP, HDP, PAP)

When the power-on password (POP), hard disk password (HDP), and supervisor password (PAP) are used, the following situations may occur:

- ***When POP is the same as HDP-1 or HDP-2***

  The POP prompt appears, but one of the HDP prompts does not appear.

- ***When POP is not the same as HDP-1 and HDP-2***

  The POP, HDP-1, and HDP-2 prompts all appear.

- ***When PAP is used with HDP-1 or HDP-2***

  When PAP is used, HDP-1 or HDP-2 are enabled automatically, but no HDP prompt appears. HDP-1 and HDP-2 are set the same as PAP.

How to Run a Low-Level Format

Do the following to format the hard disk.

Attention: Make sure the address of the drive to be formatted is correct. This procedure erases all information on the disk.

1. Power-off the computer.
2. Insert the ThinkPad Hardware Maintenance Diskette Version 1.40 into diskette drive A and power-on the computer.
3. Select **Format the hard disk** from the main menu.
4. Select the drive from the menu.
5. Follow the instructions on the screen.

PC Test Card LED

The green LED on the PC test card turns on when the PCMCIA test is running. If the LED does not turn on, check that the card is installed correctly by reseating the card. If it still does not turn on after it is reseated, try using another slot for the test. If the LED still does not turn on and the test fails, replace the FRU shown by the diagnostic error code.

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Fn Key Combinations

The following table shows the **Fn** key and function key combinations and their corresponding functions.

The **Fn** key works independently from the operating system. The operating system obtains the status through the system management interface to control the system.

Fn +	**Description**
F1	Reserved
F2	Fuel-Gauge display on or off
F3	Standby mode invocation
F4	Suspend mode invocation
F5	Reserved
F6	Reserved
F7	LCD or CRT display
F8	Reserved
F9	Reserved
F10	Reserved
F11	Power management mode (toggling between high power, intelligent, and economy)
F12	Hibernation invocation

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Product Overview (760)

The following table shows an overview of the system features:

Model 760C or 760CD

Feature	Description
Processor	• Intel® Pentium® 90 MHz with 256KB L2 Cache • Intel Pentium 120 MHz with 256KB L2 Cache
Bus architecture	• AT bus • VESA local bus for video subsystem
Memory (standard)	8MB (on the system board)
Memory (option)	• 4MB, 8MB, 16MB, DIMM (max. 40MB) • DIMM adapter
CMOS RAM	114 bytes
VGA video	• 12.1-inch, 64K colors, 800×600 pixel TFT color LCD • 10.4-inch, 64K colors, 800×600 pixel TFT color LCD
Diskette drive (removable)	• 720KB, 1.2MB, 1.44MB, 2.88MB (4-mode), 3.5-inch • 720KB, 1.2MB, 1.44MB (3-mode), 3.5-inch
Hard disk drive (removable)	• **760C** – 360MB, 2.5-inch – 720MB, 2.5-inch • **760CD** – 810MB, 2.5-inch – 1200MB, 2.5-inch
Enhanced video card	• **760CD** – Video accelerator – Video capture and overlay – Video composite in/out – MPEG hardware decoding – MPEG2
CD-ROM (removable)	• **760CD** – 5-inch, quadruple speed, IDE interface
DSP card	• Audio function • Fax/modem function • Telephony function • MWave function
Infrared transfer	• Two IR ports • IrDA 1.0 • ASK • 1.15 million bps
PCMCIA	• One Type-III or two Type-II

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Model 760E or 760ED

Feature	Description
Processor	• Intel Pentium 120 MHz with 256KB L2 Cache • Intel Pentium 133 MHz with 256KB L2 Cache • Intel Pentium 150 MHz with 256KB L2 Cache
Bus architecture	• PCI bus • VESA local bus for video subsystem
Memory (standard)	8MB or 16MB (on the system board)
Memory (option)	• 8MB, 16MB, 32MB, DIMM (max. 72MB or 80MB) • DIMM adapter
CMOS RAM	114 bytes + 4 kilobytes
VGA video	• 12.1-inch, 64K colors, 800×600 pixel TFT color LCD • 12.1-inch, 64K colors, 1024×768 pixel TFT color LCD
Diskette drive (removable)	• 720KB, 1.2MB, 1.44MB, 2.88MB (4-mode), 3.5-inch • 720KB, 1.2MB, 1.44MB (3-mode), 3.5-inch
Hard disk drive (removable)	• 810MB, 2.5-inch • 1.08GB, 2.5-inch • 1.2GB, 2.5-inch • 1.35GB, 2.5-inch • 2.1GB, 2.5-inch
Enhanced video card	• **760ED (enhanced model)** – Video accelerator – Video capture and overlay – Video composite in/out – S-video in – MPEG hardware decoding – MPEG2
CD-ROM (removable)	• **760ED** – 5-inch, 4X, 6X, or 8X speed, IDE interface
DSP card	• Audio function • Fax/modem function • Telephony function • MWave function
Infrared transfer	• Two IR ports • IrDA 1.0 • ASK • 1.15 million bps
PCMCIA/cardbus	• One Type-III or two Type-II

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Model 760L or 760LD

Feature	Description
Processor	• Intel Pentium 90 MHz with 256KB L2 Cache • Intel Pentium 120 MHz with 256KB L2 Cache
Bus architecture	• AT bus • VESA local bus for video subsystem
Memory (standard)	8MB (on the system board)
Memory (option)	• 4MB, 8MB, 16MB, DIMM (max. 40MB) • DIMM adapter
CMOS RAM	114 Bytes
VGA video	• 12.1-inch, 64K colors, 800×600 pixel TFT color LCD • 10.4-inch, 64K colors, 800×600 pixel TFT color LCD
Diskette drive (removable)	• 720KB, 1.2MB, 1.44MB, 2.88MB (4-mode), 3.5-inch • 720KB, 1.2MB, 1.44MB (3-mode), 3.5-inch
Hard disk drive (removable)	• 810MB, 2.5-inch • 1.08GB, 2.5-inch • 1.2GB, 2.5-inch
CD-ROM (removable)	• **760LD** – 5-inch, quadruple speed, IDE interface
ESS card	• Audio function
Infrared transfer	• Two IR ports • IrDA 1.0 • ASK • 1.15 million bps
PCMCIA	• One Type-III or two Type-II

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Model 760EL or 760ELD

Feature	Description
Processor	• Intel Pentium 100 MHz w/o L2 Cache • Intel Pentium 120 MHz w/o L2 Cache • Intel Pentium 133 MHz w/o L2 Cache
Bus architecture	• PCI bus • VESA local bus for video subsystem
Memory (standard)	8MB or 16MB (on the system board)
Memory (option)	• 8MB, 16MB, 32MB, DIMM (max. 72MB or 80MB) • DIMM adapter
CMOS RAM	114 bytes + 4 kilobytes
VGA video	• 12.1-inch, 64K colors, 800×600 pixel TFT color LCD • 11.3-inch, 256 colors, 800×600 pixel DSTN color LCD
Diskette drive (removable)	• 720KB, 1.2MB, 1.44MB, 2.88MB (4-mode), 3.5-inch • 720KB, 1.2MB, 1.44MB (3-mode), 3.5-inch
Hard disk drive (removable)	• 810MB, 2.5-inch • 1.08GB, 2.5-inch • 1.2GB, 2.5-inch
CD-ROM (removable)	• **760ELD** – 5-inch, quadruple speed, IDE interface
ESS card	• Audio function
Infrared transfer	• Two IR ports • IrDA 1.0 • ASK • 1.15 million bps
PCMCIA/cardbus	• One Type-III or two Type-II

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Model 760XL or 760XD

Feature	Description
Processor	• **760XL/760XD** – Intel MMX Pentium 166MHz with 256KB L2 Cache
Bus architecture	• PCI bus • VESA local bus for video subsystem
Memory (standard)	• **760XL** – 16MB • **760XD** – 32MB (16MB on the system board and 16MB as DIMM)
Memory (option)	• 8 MB, 16MB, and 32MB DIMM
CMOS RAM	114 bytes + 4 kilobytes
VGA video	• **760XD** – 12.1-inch, 64K colors, 1024×768 pixel XGA TFT color LCD • **760XL** – 12.1-inch, 64K colors, 800×600 pixel SVGA TFT color LCD
Diskette drive (removable)	• 720KB, 1.2MB, 1.44MB, 2.88MB (4-mode), 3.5-inch • 720KB, 1.2MB, 1.44MB (3-mode), 3.5-inch
Hard disk drive (removable)	• **760XD** – 3.0GB 2.5-inch • **760XL** – 2.1GB 2.5-inch
CD-ROM (removable)	• **760XD** – 5-inch, 8x speed, IDE interface
Audio function	• **760XD** – DSP card • **760XL** – ESS card
Infrared transfer	• Two IR ports • IrDA 1.0 • ASK • 1.15 million bps
PCMCIA/cardbus	• One Type-III or two Type-II

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FRU Removals and Replacements

This section contains information about removals and replacements.

- Do not damage any part. Only certified and trained personnel should service the computer.
- The arrows in this section show the direction of movement to remove a FRU, or to turn a screw to release the FRU. The arrows are marked in numeric order, in square callouts, to show the correct sequence of removal.
- Any FRUs that must be removed before removing the failing FRU are listed at the top of the page.
- To replace a FRU, reverse the removal procedure and follow any notes that pertain to replacement. See “Locations” on page 341 for internal cable connections and arrangement information.
- When replacing a FRU, use the correct screw size, as shown in the procedure.

Safety Notice 1: Translation on page 8

Before the computer is powered-on after FRU replacement, make sure all screws, springs, or other small parts, are in place and are not left loose inside the computer. Verify this by shaking the computer and listening for rattling sounds. Metallic parts or metal flakes can cause electrical short circuits.

Safety Notice 3: Translation on page 10

The battery pack contains small amounts of nickel. Do not disassemble it, throw it into fire or water, or short-circuit it. Dispose of the battery pack as required by local ordinances or regulations.

Safety Notice 8: Translation on page 14

Before removing any FRU, power-off the computer, unplug all power cords from electrical outlets, remove the battery pack, and then disconnect any interconnecting cables.

Safety Notice 4: Translation on page 11

The lithium battery can cause a fire, explosion, or severe burn. Do not recharge it, remove its polarized connector, disassemble it, heat it above 100°C (212°F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

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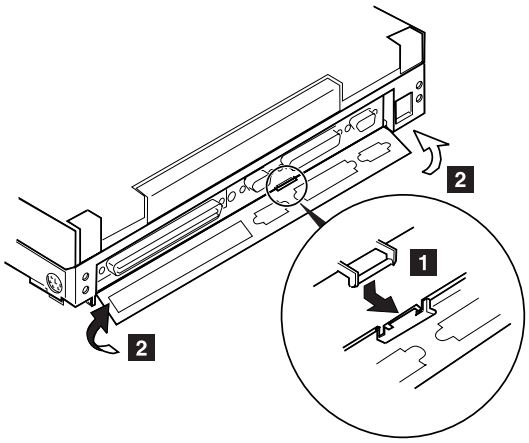
1010 Rear Connector Door

Remove the center latch 1 ; then remove the rear connector door by flexing it 2 .



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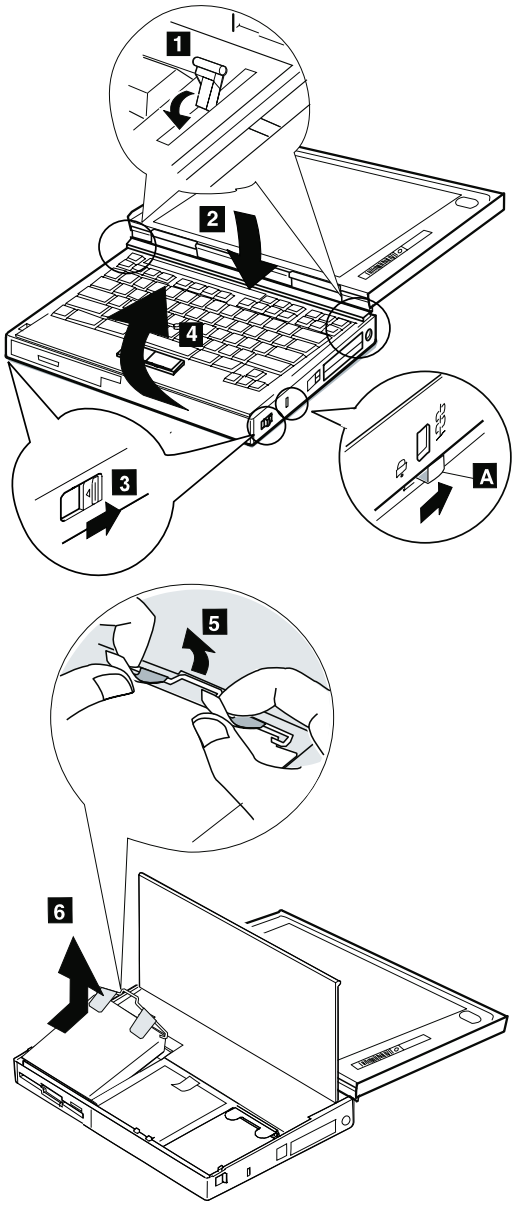
1020 Diskette Drive/CD-ROM Drive

Diskette Drive (Model Unique)

Note: If the security latch **A** is at the left position, push and slide it to the right position (unlock).



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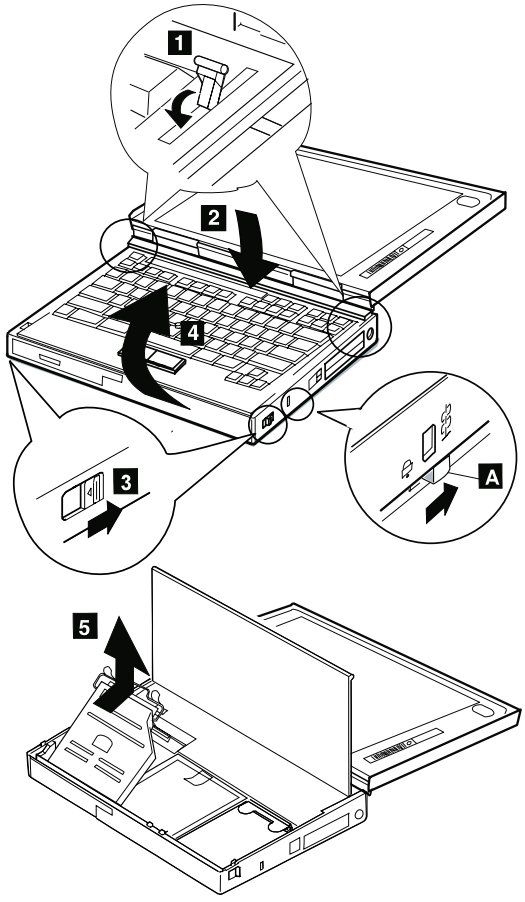
CD-ROM Drive (Model Unique)

Attention

Note: Remove the CD-ROM drive exactly as shown in the figure. Do not apply any extra force to the CD-ROM drive when removing it.

Note: If the security latch **A** is at the left position, push and slide it to the right position (unlock).



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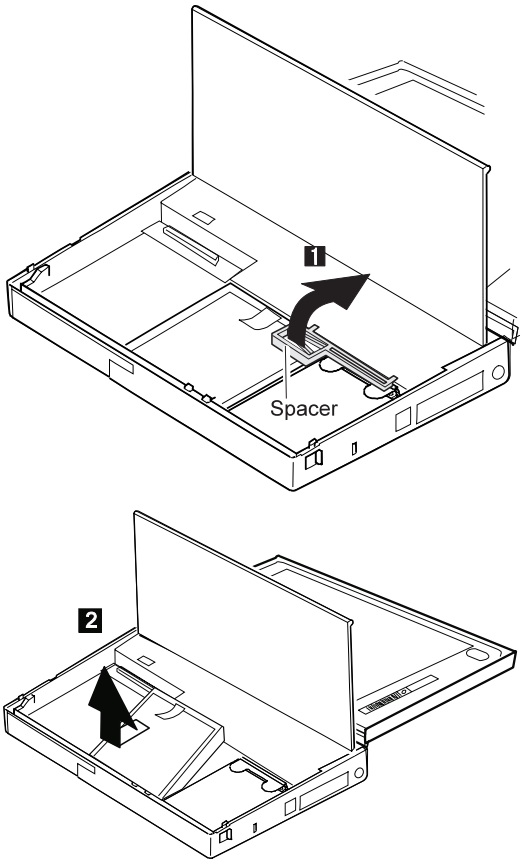
1030 Battery Pack

- CD-ROM Drive (Model unique) **(1020)**

Note: Be careful that the computer does not fall backward when the battery pack is removed.

If there is a spacer, open the spacer before removing the battery pack.



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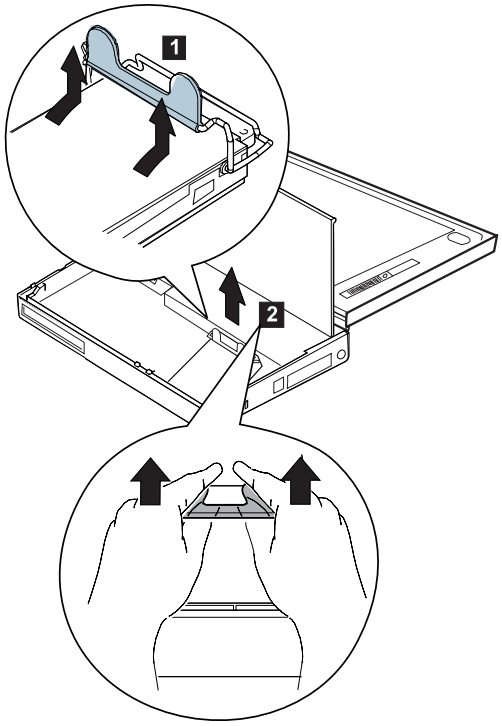
1040 Hard Disk Drive

- Diskette Drive/CD-ROM Drive **(1020)**
- Battery Pack **(1030)**

Attention

Do not drop or apply any shock to the hard disk drive. The hard disk drive is sensitive to physical shock. Incorrect handling can cause damage and permanent loss of data on the hard disk. Before removing the hard disk drive, have the user make a backup copy of all the information on the hard disk. Never remove the hard disk drive while the system is operating or is in suspend mode.

Note: Remove the hard disk drive exactly as shown in the figure. Do not apply any extra force to the hard disk drive when removing it.



Note: After replacing the hard disk drive, latch the removal strap into the correct position.

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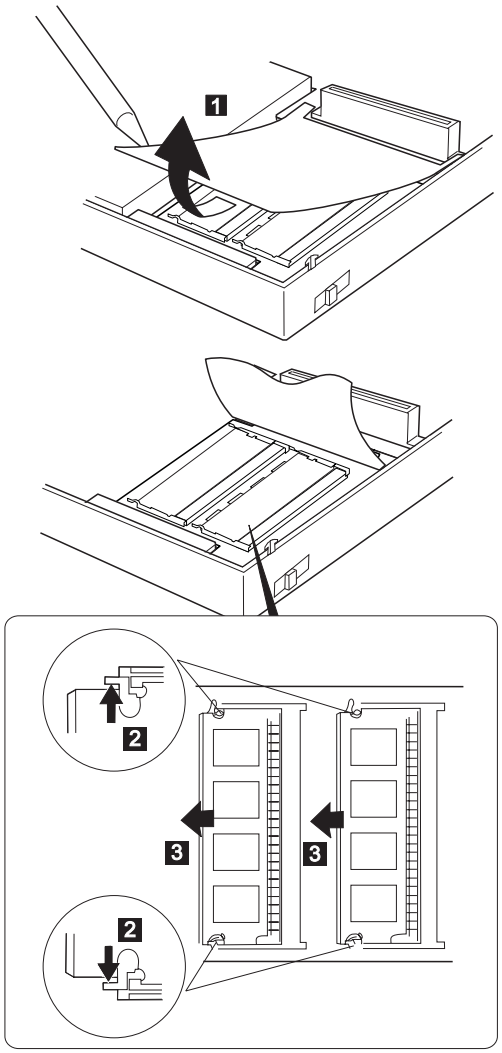
1050 DIMM

760XL/760XD

- Diskette Drive/CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**



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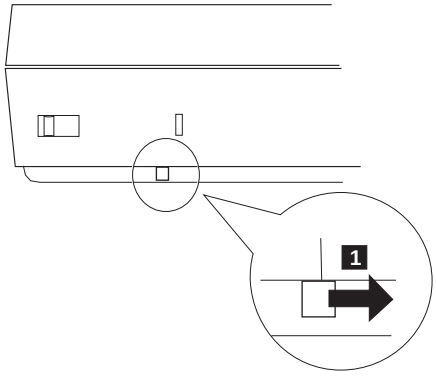
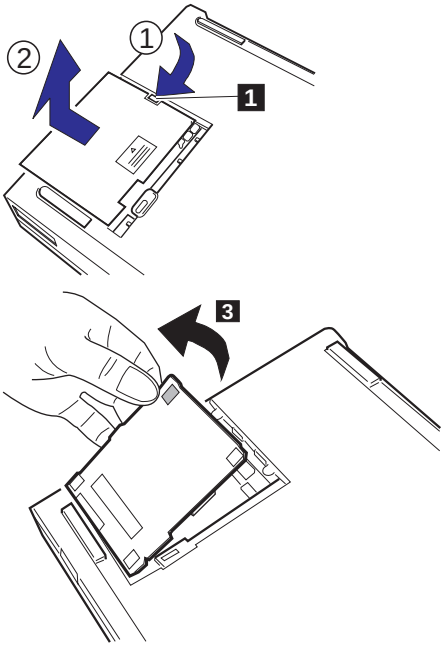
Other Models



Turn the computer upside down.



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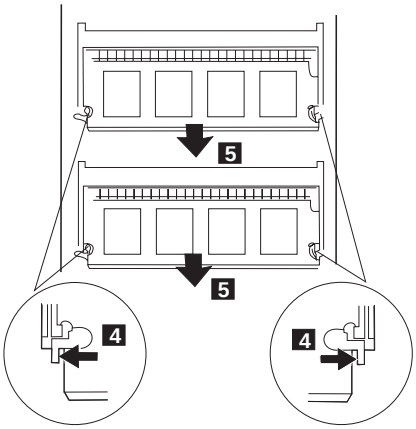

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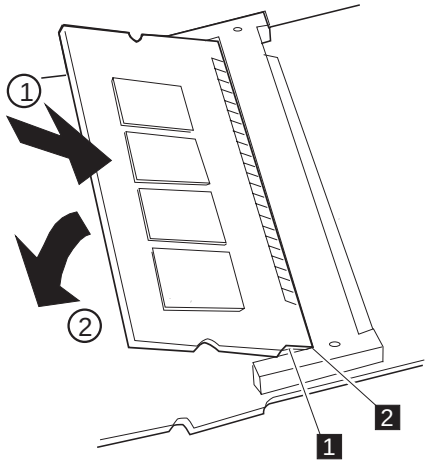
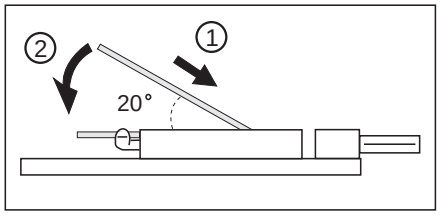
Note: When installing the DIMM, do the following:

1. Find the notch **1** on the side of the DIMM.
2. With the notched end of the DIMM toward the right side of the socket **2**, insert the DIMM, at an angle of approximately 20°, into the socket; then press it firmly.
3. Pivot the DIMM until it snaps into place.



Side View



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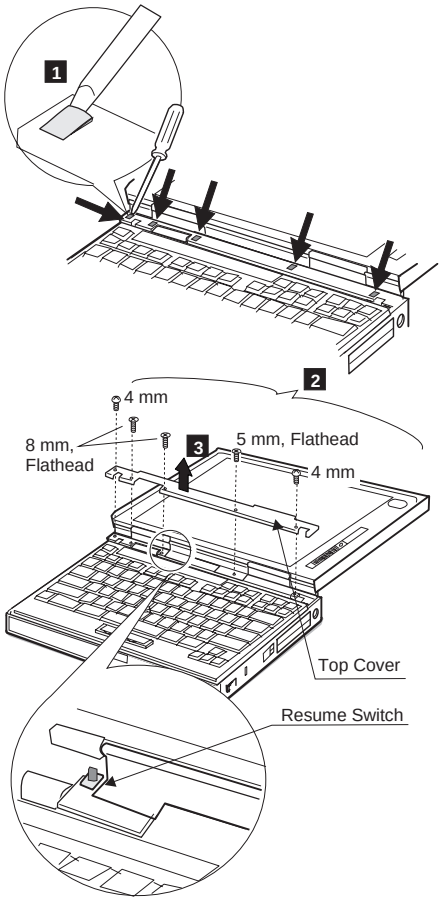
1060 Top Cover

- Diskette Drive/CD-ROM Drive **(1020)**
- Battery Pack (760C/760L/760E/760EL) **(1030)**
- Hard Disk Drive **(1040)**

Note: When replacing the top cover, be careful not to damage the resume switch, shown in the figure.



Step	Size (Quantity)	Torque
2	4mm, Nylon (2)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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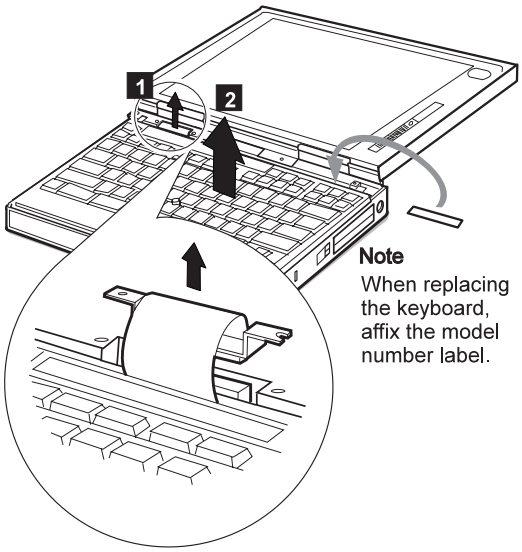
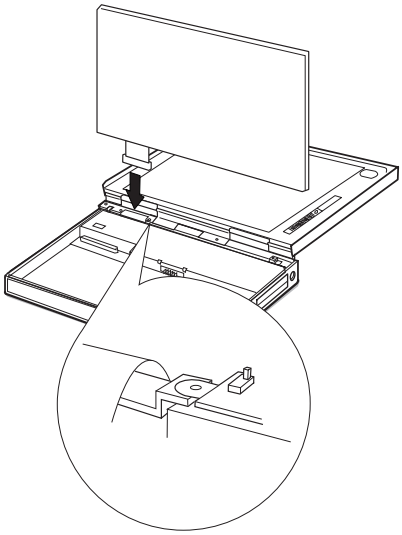
1070 Keyboard Unit

- Top Cover **(1060)**



When replacing the keyboard unit, connect the keyboard connector as shown in the figure; then replace the keyboard.



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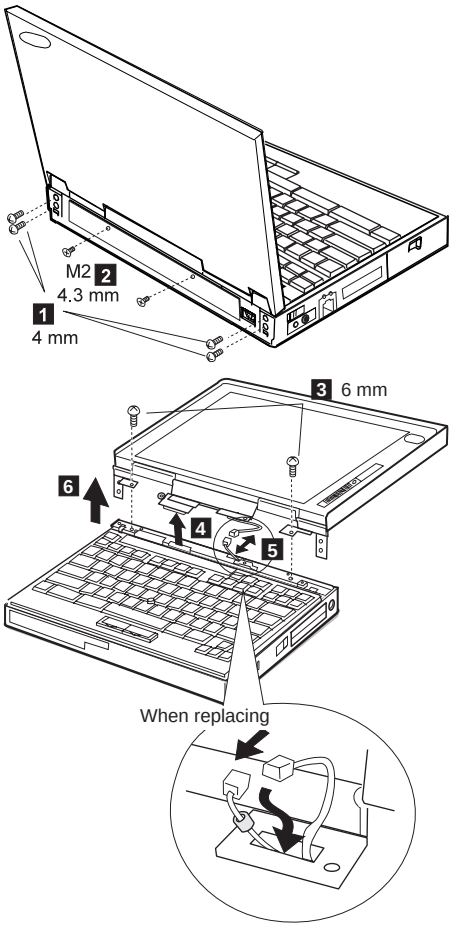
1080 LCD Unit

- Diskette Drive/CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**



Step	Size (Quantity)	Torque
1	4mm, Nylon (4)	4.5 kgcm
3	6mm, Nylon (2)	4.5 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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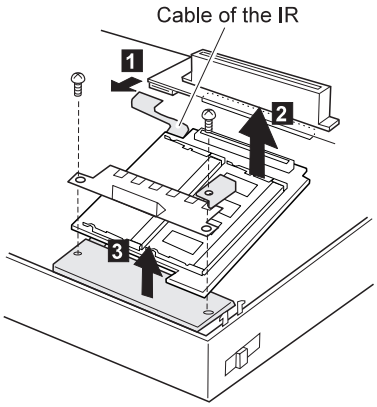
1090 Front IR

Models 760XL/760XD

- Diskette Drive/CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- System Board Assembly **(1100)**

After removing the DIMM adapter card, remove the front IR.



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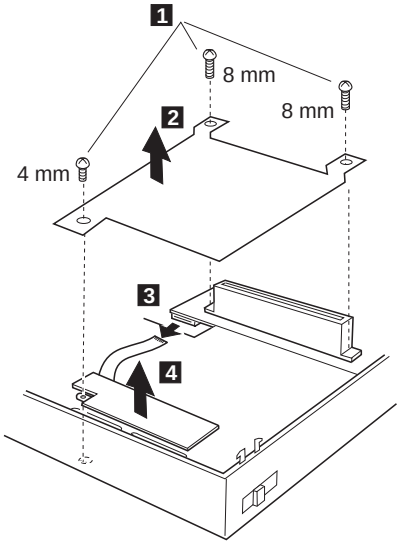
Other Models

- Diskette Drive/CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**



Step	Size (Quantity)	Torque
1	8mm, Nylon (2) 4mm, Nylon (1)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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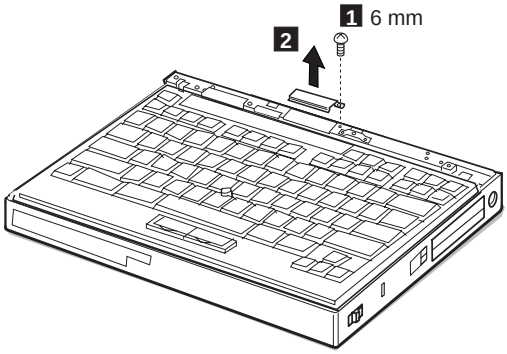
1095 Rear IR

- Diskette Drive/CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- LCD Unit **(1080)**



Step	Size (Quantity)	Torque
1	6mm, Nylon (4)	4 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

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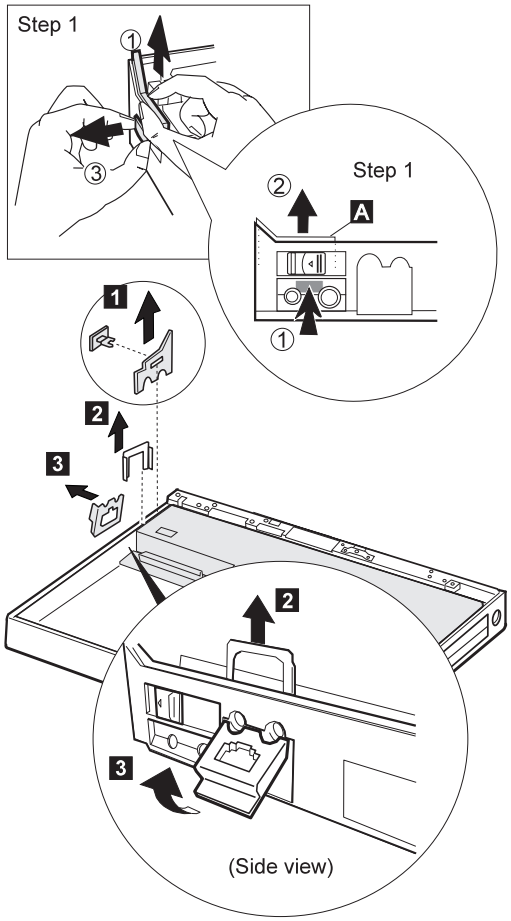
1100 System Board Assembly

- Diskette Drive/CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- Rear IR **(1090)**

Note: In step 1, gently pushing the shaded area ① , lift the switch cover halfway up ② , as shown. Then pull the switch lever out to remove ③ .



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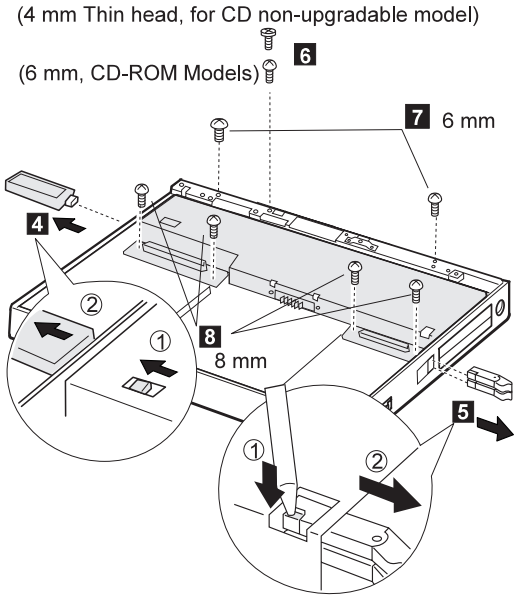

Notes:

1. Step 4 is a DSP-model-unique step. DSP models are:
   - Models 760C/760E/760CD/760ED/760XD
2. In step 5, gently push the levers to avoid flexing them.

Step	Size (Quantity)	Torque
7	6mm, Nylon (2)	4 kgcm
8	8mm, Nylon (4)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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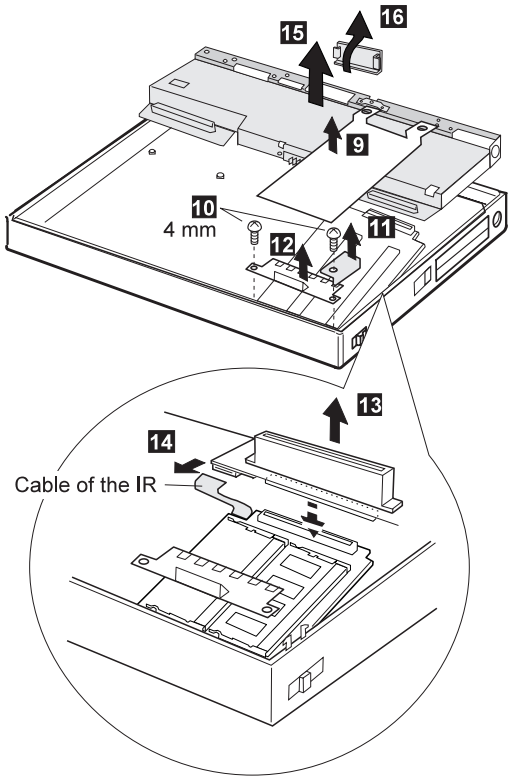
Models 760XL/760XD

For Models 760XL or 760XD, raise the system board assembly slightly to disconnect the DIMM adapter card in step 12 . **Be careful not to damage the IR flexible cable under the DIMM adapter card.** Then remove the IR flexible cable in step 13 .



When replacing:

Refer to the following figure to locate the DIMM adapter card. Make sure that the connector of the DIMM adapter card is connected firmly. A loose or wrong connection can cause memory errors.

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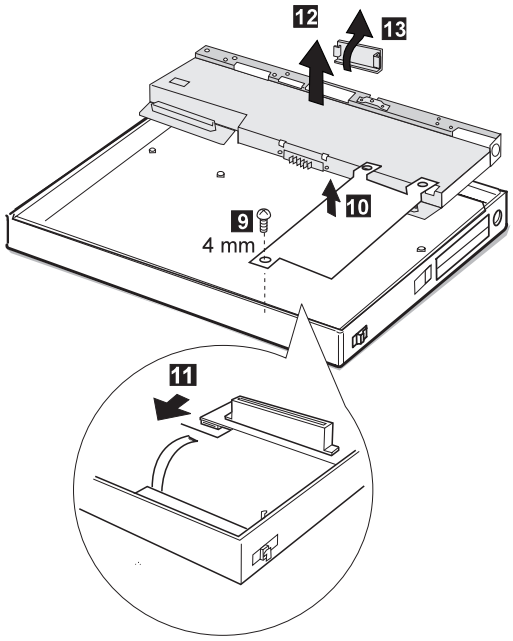
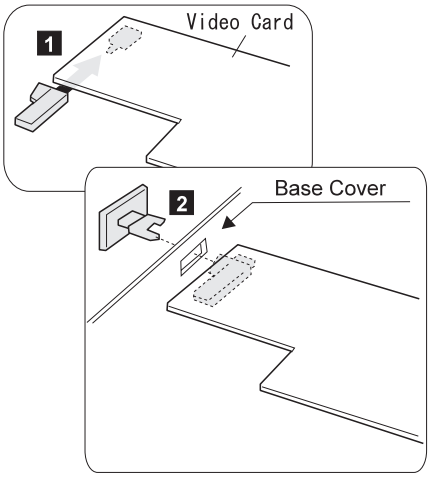
Other Models



When replacing:

When replacing the power switch, align the power switch and power actuator in step 2 of the following figure. Check that the power switch operates correctly before tightening any screws.



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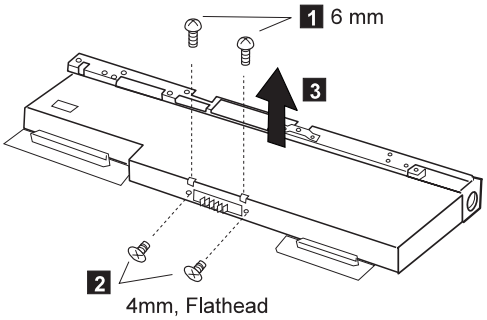
1125 Upper Shield

- Diskette Drive/CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- Front IR and Rear IR **(1090)**
- System Board Assembly **(1100)**



Step	Size (Quantity)	Torque
1	6mm, Nylon (4)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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1110 Video Card/Fan (Model Unique)

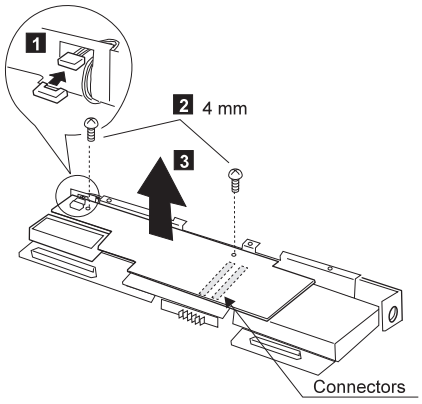
- Diskette Drive/CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- Front IR and Rear IR **(1090)**
- System Board Assembly **(1100)**
- Upper Shield **(1125)**

Verify the Model

There are two models of 760ED: one with a standard video card, the other with an enhanced video card. If you install the incorrect video card, the LCD will not work. Verify the 760ED model you are servicing.

Standard Video Card

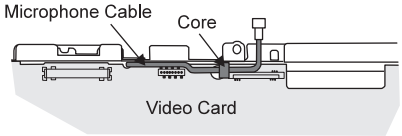
- **Models 760C/760L/760E/760ED/760EL/760LD/760ELD**



Step	Size (Quantity)	Torque
2	4mm, Nylon (2)	4 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

The following shows the microphone routing.



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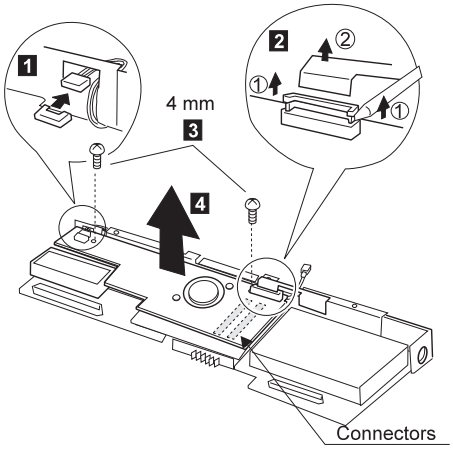
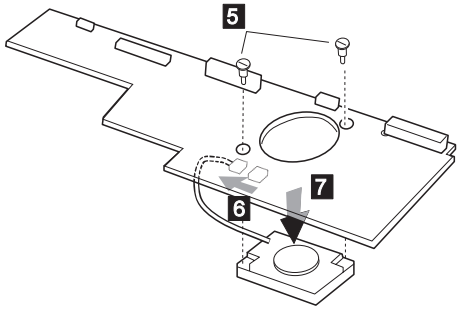
- **760XL**

  Note: Be careful not to touch the fan rotor when assembling or disassembling.

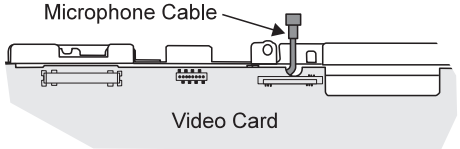


Step	Size (Quantity)	Torque
3	4mm, Nylon (2)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		



When replacing:

The following figure shows the microphone routing.



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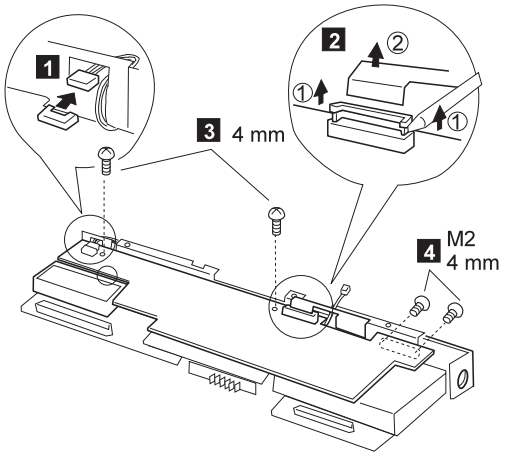
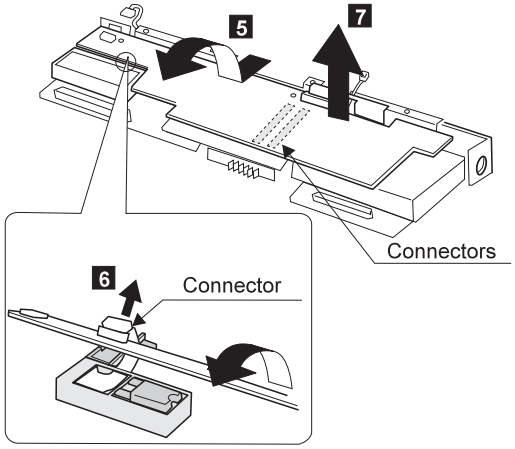
Enhanced Video Card



Step	Size (Quantity)	Torque
3	4mm, Nylon (2)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

In step 5 , turn the video card upside down to disconnect the cable in step 6 .



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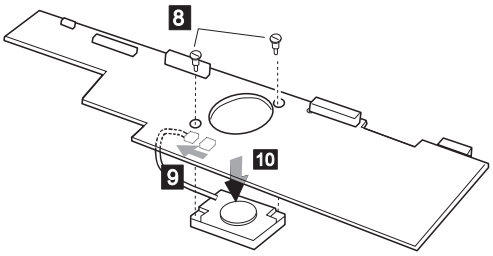
For Model 760XD, remove the fan as follows.

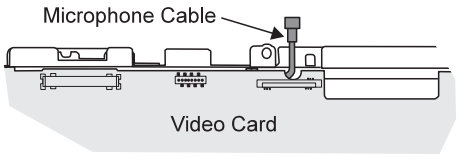
Note: Be careful not to touch the fan rotor when assembling or disassembling.



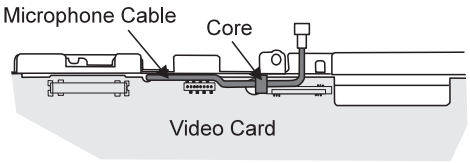
When replacing:

The following figure shows the microphone routing.

- **Model 760XD**



- **Other Models**



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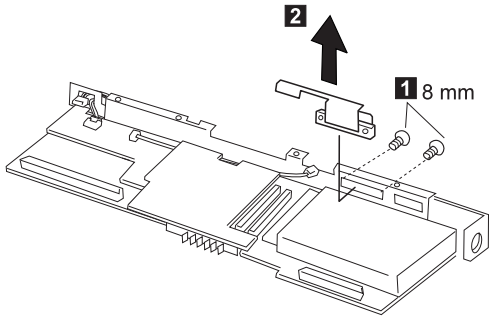
1135 External Diskette Drive Connector

- Diskette Drive/CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- Front IR and Rear IR **(1090)**
- System Board Assembly **(1100)**
- Upper Shield **(1125)**
- Video Card **(1110)**

For models
760CD/760LD/760E/760ED/760EL/760ELD/760XL/760XD



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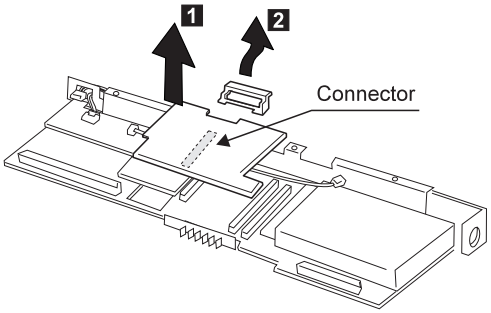
1120 DC/DC Card

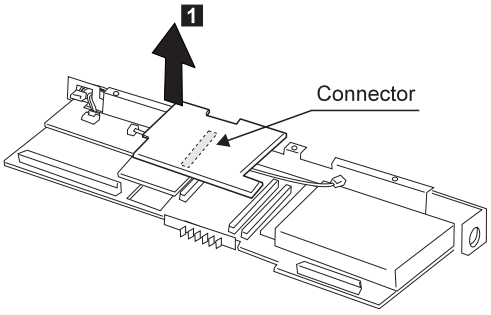
- Diskette Drive/CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- Front IR and Rear IR **(1090)**
- System Board Assembly **(1100)**
- Upper Shield **(1125)**
- Video Card **(1110)**

760XL/760XD

1 : DC/DC Card
2 : Air Duct



Other Models



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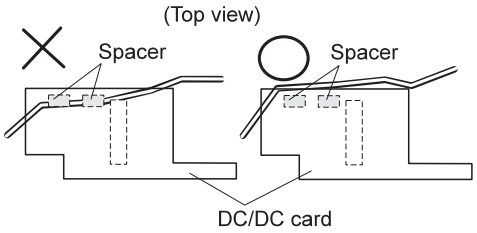
When replacing:

Make sure that the microphone cable does not catch between the system board and the spacer on the DC/DC card.



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1130 DSP Card/ Audio (ESS) Card

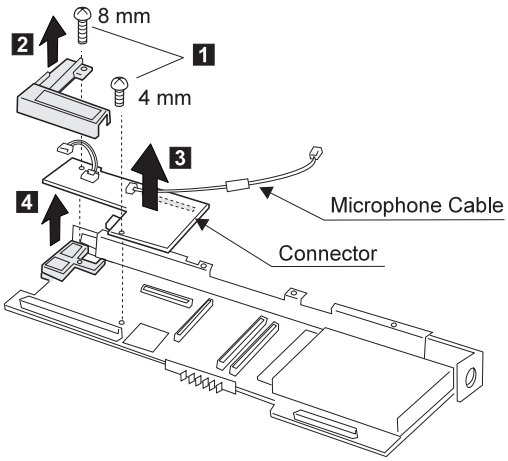
- Diskette Drive/CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- Front IR and Rear IR **(1090)**
- System Board Assembly **(1100)**
- Upper Shield **(1125)**
- Video Card **(1110)**
- DC/DC Card **(1120)**

Notes:

1. There are two models for 760E, slim type and thick type. Check the screw length in step **2** when removing the DSP card.
2. See the following table and make sure to replace the correct card.

Audio (ESS) Card	DSP card
760L 760LD 760EL 760ELD 760XL	760C 760E 760CD 760ED 760XD

Slim-Type Models (Models 760C/760E/760L)



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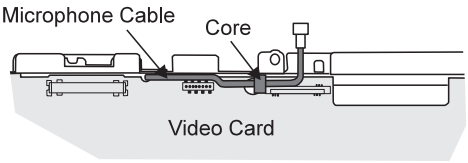
When replacing:

1. The following figure shows the microphone cable routing.



2. When replacing the DSP card or the audio (ESS) card, make sure that the connector on the card is not loose. If the connector does not connect properly, no sound will be produced.

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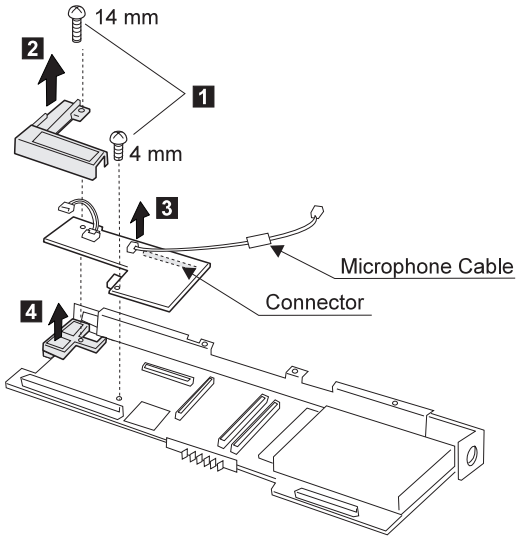
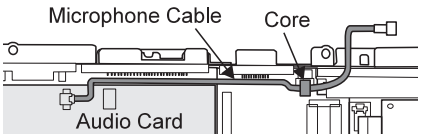
Thick-Type Models (Other Models and 760E)



When replacing:

1. The following figure shows the microphone cable routing for models 760XL/760XD.



2. When replacing the DSP card or the audio (ESS) card, make sure that the connector on the card is not loose. If the connector does not connect properly, no sound will be produced.

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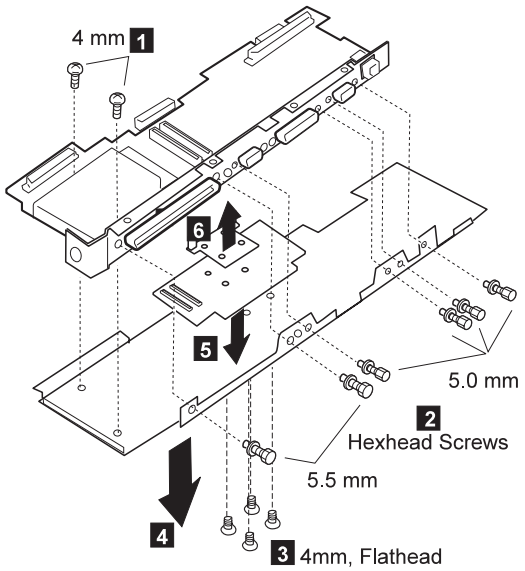
1140 CPU Card

- Diskette Drive/CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- Front IR and Rear IR **(1090)**
- System Board Assembly **(1100)**
- Upper Shield **(1125)**
- Video Card **(1110)**
- DC/DC Card **(1120)**
- DSP Card / Audio (ESS) Card **(1130)**



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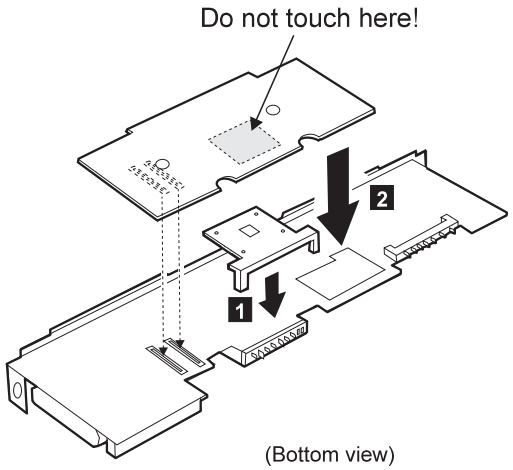
Be careful

- Connect the CPU card using the exact procedure shown in the figures, and make sure that the two CPU card connectors are connected properly. If these connectors are not connected, you cannot power on the computer.
- **Do not apply any extra force to the shaded area of the CPU card when connecting.**



(Bottom view)

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1150 System Board and PCMCIA Slot Assembly

- Diskette Drive/CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- Front IR and Rear IR **(1090)**
- Video Card **(1110)**
- DC/DC Card **(1120)**
- DSP Card / Audio (ESS) Card **(1130)**
- CPU Card **(1140)**

Notes:

1. The system unit serial number must be restored when the system board is replaced. To restore the system unit serial number, select the option “Set system identification” on the maintenance diskette. The EEPROM on the system board contains the vital product data (VPD): the system unit serial number, system board system number, and other computer-unique data.

   Note: Do not power off the computer when restoring the VPD.

   The system unit serial number label is attached to the base cover.
2. Before removing and replacing the system board, make sure that the PCMCIA cards are removed and the eject levers are not sticking out.
3. Do not pull the PCMCIA slot assembly while removing the system board.
4. When handling the PCMCIA slot assembly, be careful not to disassemble any part of it. The slot assembly is not solidly fixed when it is removed from the system board or the FRU.
5. Be sure to unlock both ends of the PCMCIA connector before removing the PCMCIA slot assembly from the system board (**2**).

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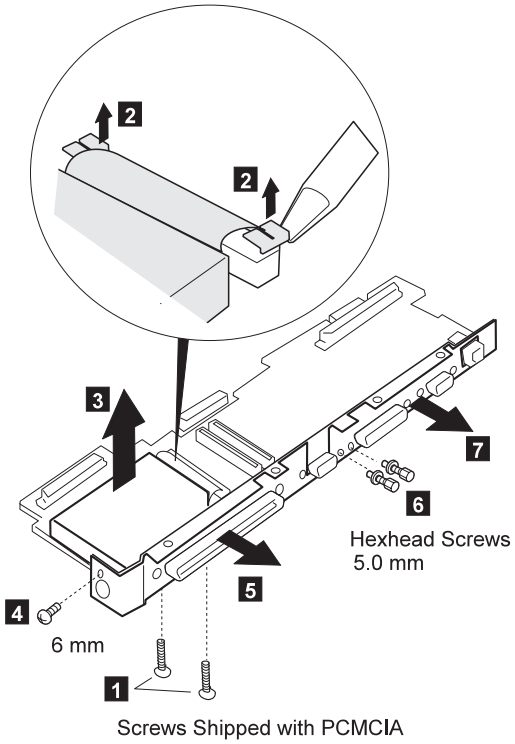
Models 760XL/760XD



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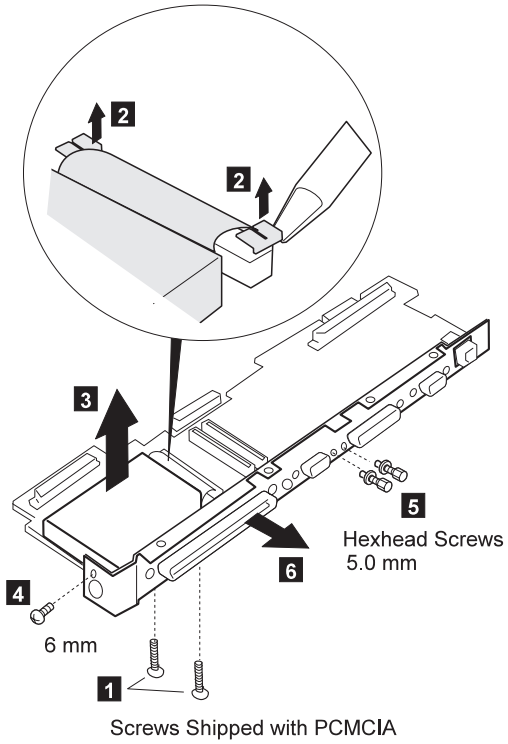
Other Models



Step	Size (Quantity)	Torque
1	14mm, Nylon (2)	2.5 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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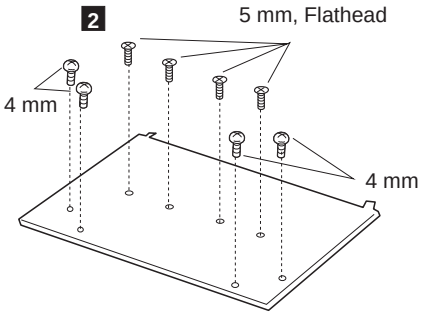
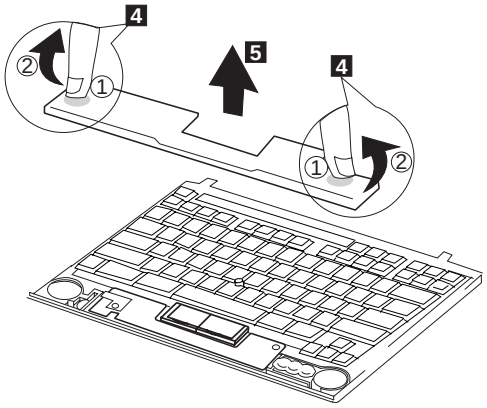
1160 Palm Rest

- Top Cover **(1060)**
- Keyboard Unit **(1070)**

1 Turn the keyboard upside down.



3 Turn the keyboard right-side up.



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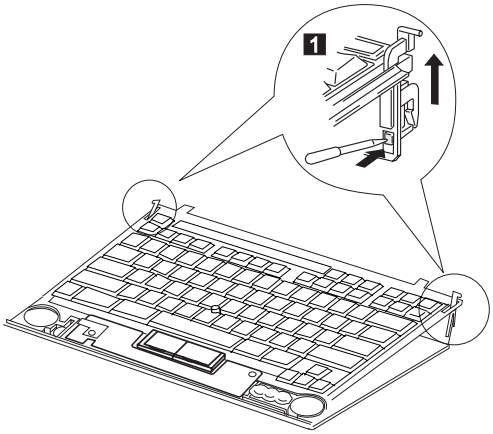
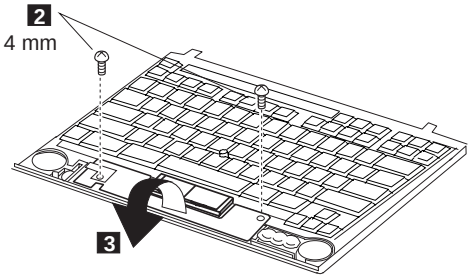
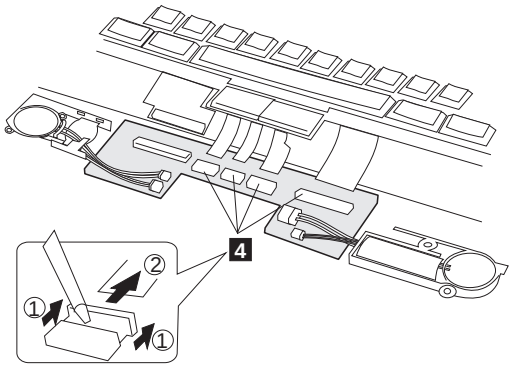
1170 Keyboard, Information Panel

- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- Palm Rest **(1160)**

Note: When pulling the lever off the foot **1**, separate the lower part of the lever from the foot by inserting a pointed device through the hole in the foot.







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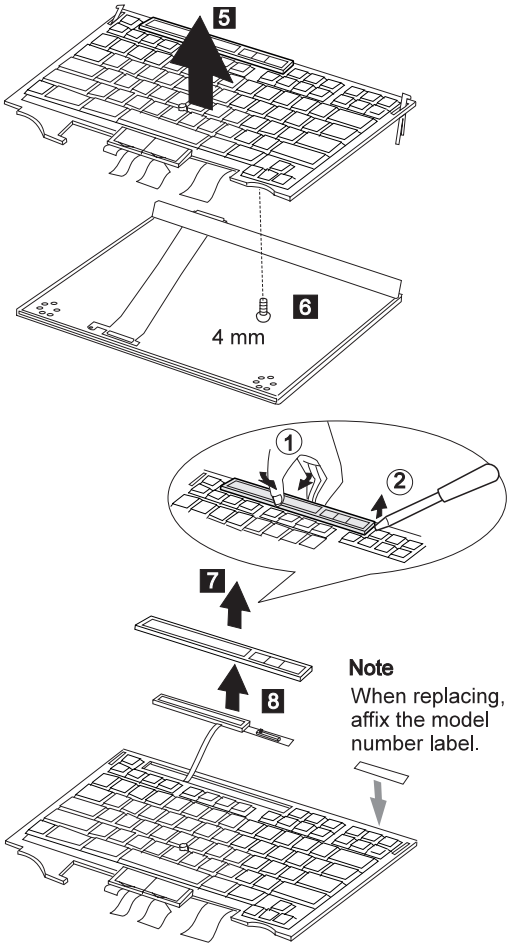

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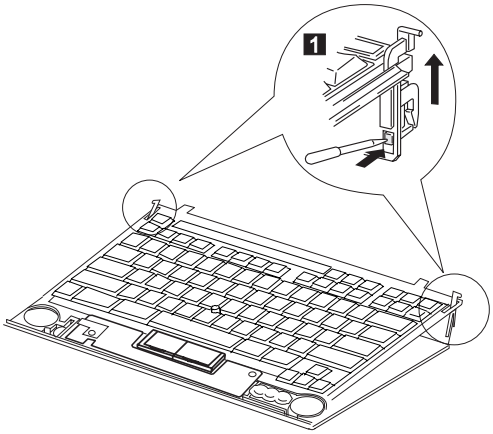
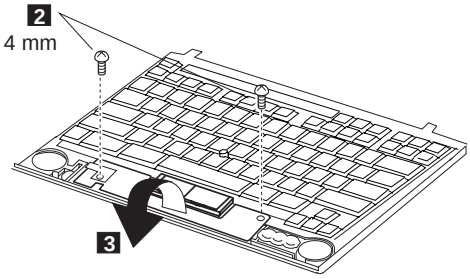
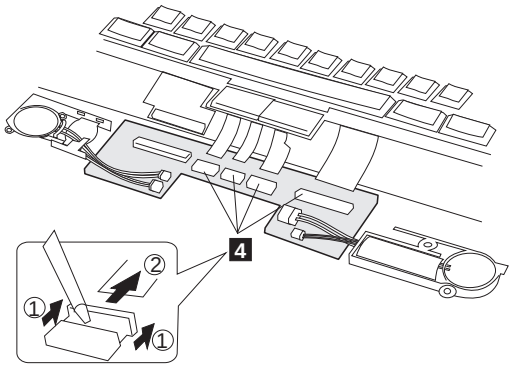
1180 Keyboard Cable

- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- Palm Rest **(1160)**

Note: When pulling the lever off the foot **1**, separate the lower part of the lever from the foot by inserting a pointed device through the hole in the foot.







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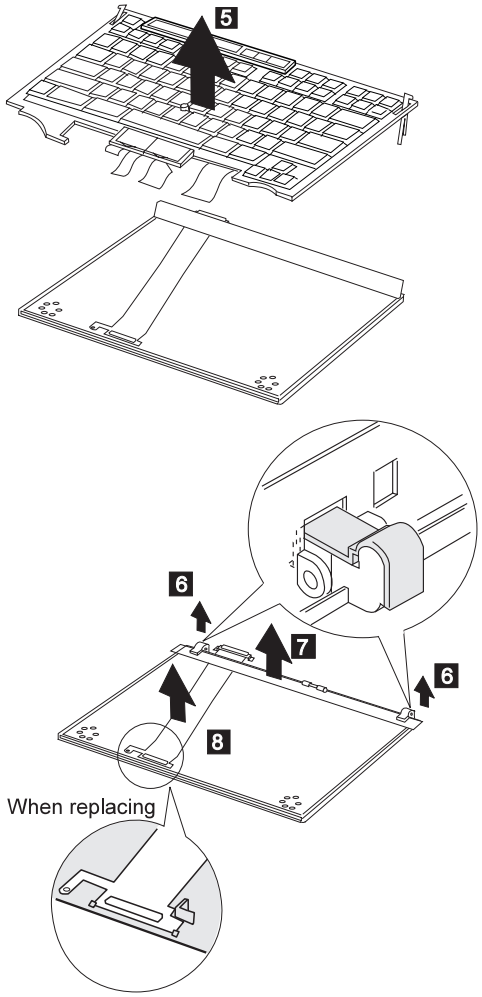

Notes:

1. When removing the latch from the keyboard base 6, push both ends of the latch simultaneously.
2. When replacing the keyboard cable, place the cable correctly, as shown by the artwork in the circle.

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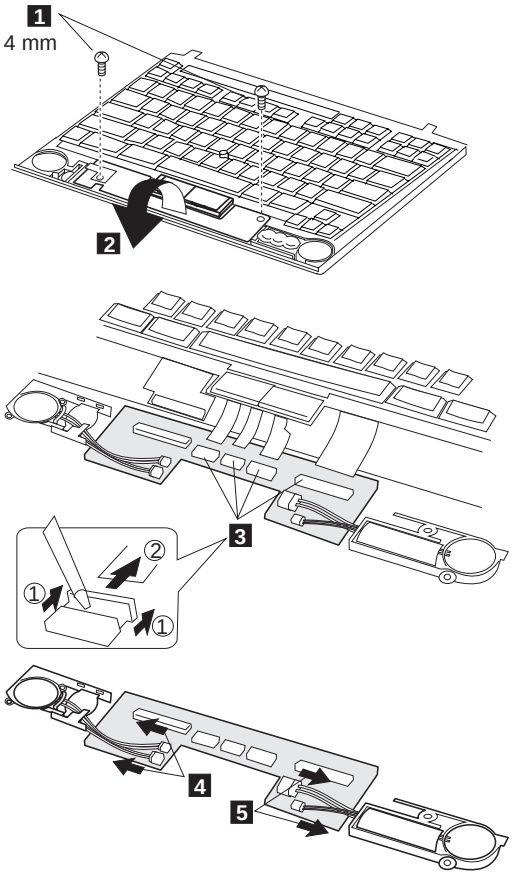
1190 Keyboard Card

- Battery Pack (760C/760L/760E/760EL) **(1020)**
- Diskette Drive/CD-ROM Drive **(1020)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- Palm Rest **(1160)**



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1200 Backup Battery, Speaker, Standby Battery

- Diskette Drive/CD-ROM Drive **(1020)**
- Battery Pack **(1030)**

> **Safety Notice 2: Translation on page 9**
>
> Some standby batteries contain a small amount of nickel and cadmium. Do not disassemble it, recharge it, throw it into fire or water, or short-circuit it. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

> **Safety Notice 4: Translation on page 11**
>
> The lithium battery can cause a fire, explosion, or severe burn. Do not recharge it, remove its polarized connector, disassemble it, heat it above 100°C (212°F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- Palm Rest **(1160)**
- Keyboard Card **(1190)**

Procedure continues on the following page.

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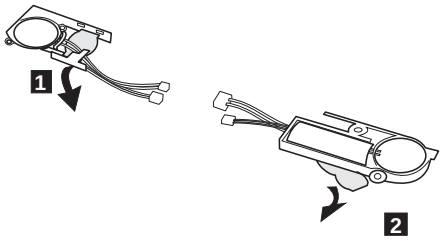
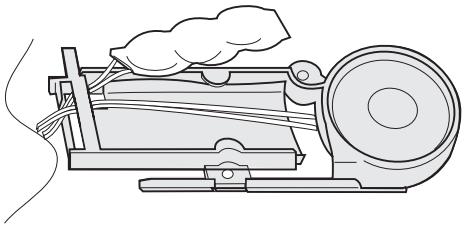
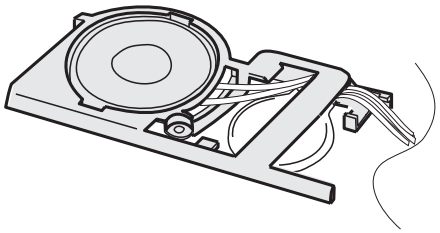
1 for Backup Battery
2 for Standby Battery
1 2 for Speaker



Note: When replacing the speakers, backup battery, and standby battery, position the cables as shown.





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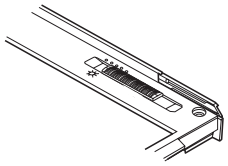
LCD Removal and Replacement

This section discusses removal and replacement procedure for the LCD unit of the ThinkPad 760x series. After removing the LCD unit, check its part number; then go to the appropriate section:

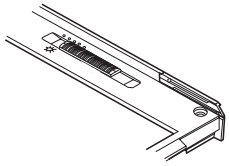
- **P/N 29H9226 (12.1 SVGA):**

  There are two types of LCDs with the part number 29H9226. They differ in the location of the brightness control slide knob:

  – **ASM P/N 29H9029:** Go to “LCD Unit, 12.1 SVGA (P/N 29H9226, ASM P/N 29H9029)” on page 291.

  – **ASM P/N 73H6599:** Go to “LCD Unit, 12.1 SVGA (P/N 29H9226, ASM P/N 73H6599)” on page 296.

- **P/N 29H9227 (10.4 SVGA):** Go to “LCD Unit, 10.4 SVGA (P/N 29H9227)” on page 302.
- **P/N 46H5355 (10.4 VGA):** Go to “LCD Unit, 10.4 VGA (P/N 46H5355)” on page 307.
- **P/N 39H6232 (11.3 SVGA):** Go to “LCD Unit, 11.3 DSTN (P/N 39H6232)” on page 312.
- **P/N 46H5735 (12.1 XGA):** Go to “LCD Unit, 12.1 XGA” on page 317.
- **P/N 82H8496 (12.1 SVGA):** Go to “LCD Unit, 12.1 SVGA (P/N 82H8496)” on page 323.
- **P/N 11J8867 (12.1 SVGA):** Go to “LCD Unit, 12.1 SVGA (P/N 11J8867, ASM P/N 11J8855)” on page 329.
- **P/N 46H5725 (ASM P/N 46H5723) (12.1 SVGA):** Go to “LCD Unit, 12.1 SVGA (P/N 46H5725, ASM P/N 46H5723)” on page 335
- **P/N 46H5735 (ASM P/N 46H5731) (12.1 XGA):** Go to “LCD Unit, 12.1 XGA” on page 317.

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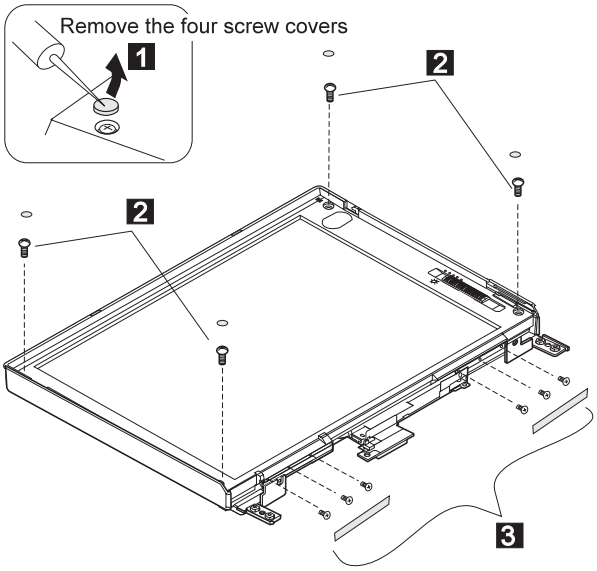
LCD Unit, 12.1 SVGA (P/N 29H9226, ASM P/N 29H9029)

1010 LCD Cover

Notes:

1. Be careful not to scratch the LCD cover when removing the screw covers 1 .
2. The LCD cover has several latches. Release these latches; then remove the LCD cover. Be careful not to break the latches.



Step	Length (Quantity)	Memo
2	M2.5 x 8 mm (4)	
3	M2 x 4.3 mm (6)	Flat head
Note: Make sure you use the correct screw when replacing.		

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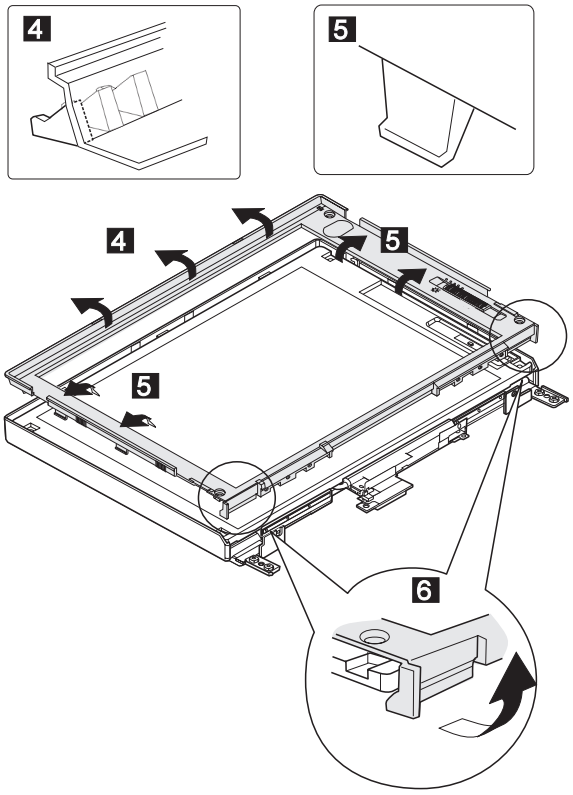

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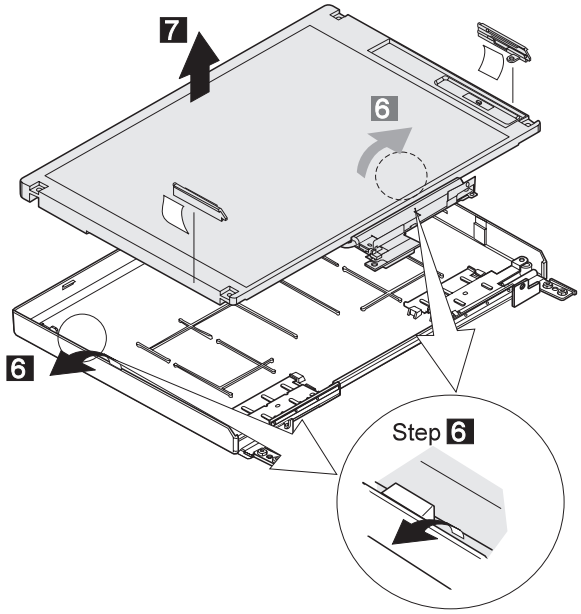
1020 LCD Panel, Interface Cable Assembly

- LCD Cover **(1010)**

Note

Be careful not to scratch or soil the surface of the LCD panel when replacing it.

The LCD panel is latched to the rear cover. Remove the LCD panel by bending the rear cover in step 6. **Too much force will break the rear cover.**



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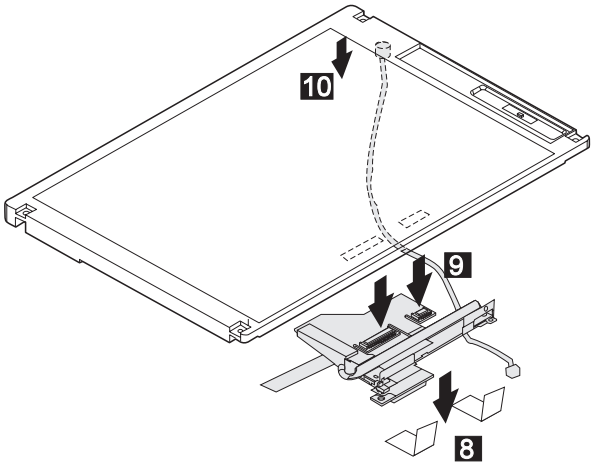

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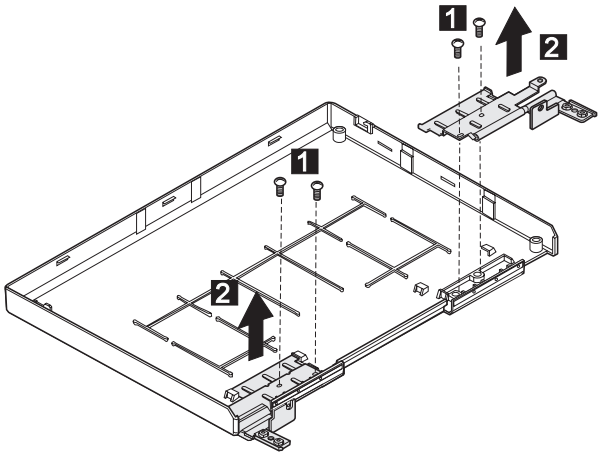
1030 Hinges

- LCD Cover **(1010)**
- LCD Panel **(1020)** (with interface cable assembly)



Step	Length (Quantity)	Memo
1	M2 x 4.3 mm (4)	
Note: Make sure you use the correct screw when replacing.		

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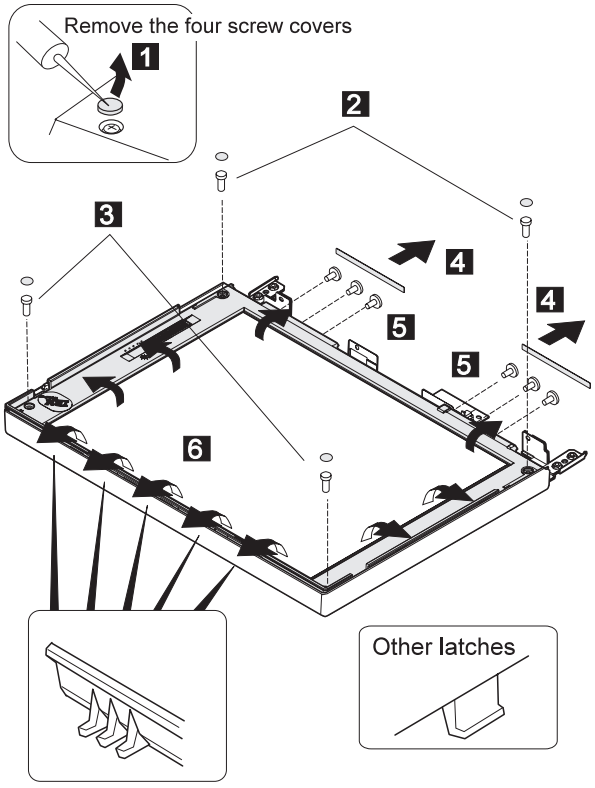
LCD Unit, 12.1 SVGA (P/N 29H9226, ASM P/N 73H6599)

2010 LCD Cover

Notes:

1. Be careful not to scratch the LCD cover when removing the screw covers 1 .
2. The LCD cover has several latches. Release these latches; then remove the LCD cover. Be careful not to break the latches.



Step	Length (Quantity)	Memo
2	M2.5 x 9 mm (2)	
3	M2.5 x 6 mm (2)	
5	M2 x 4.3 mm (6)	Flat head
Note: Make sure you use the correct screw when replacing.		

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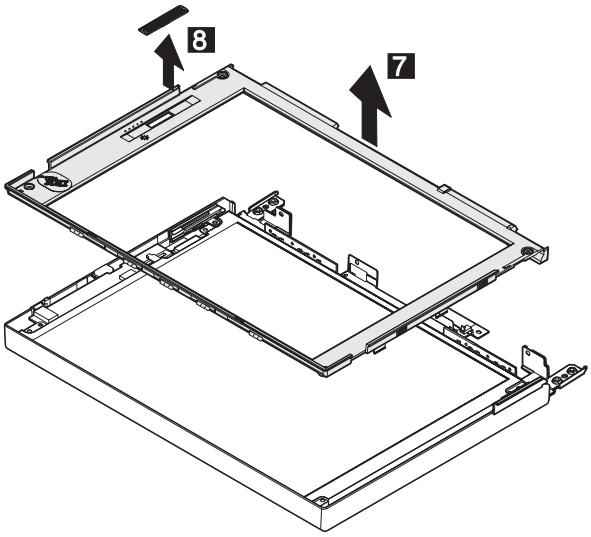
Lift the LCD front cover a bit; then remove the microphone cable.



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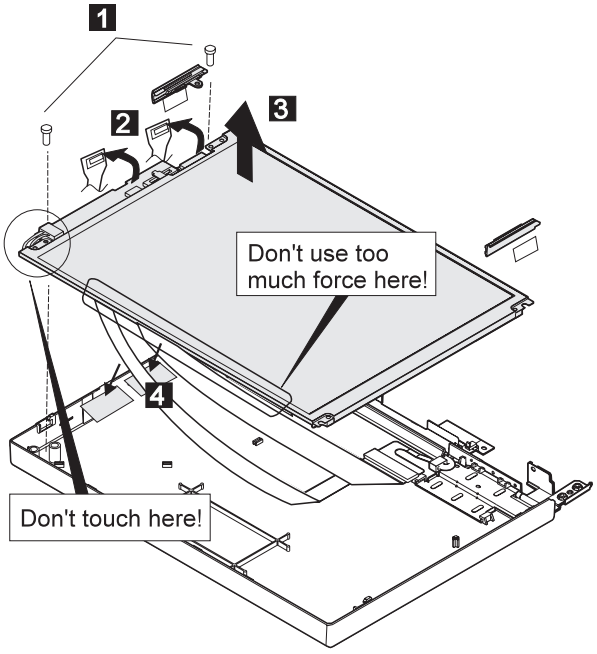
2020 LCD Panel

- LCD Cover **(2010)**

Note

Be careful not to scratch or soil the surface of the LCD panel when replacing it.

Lift the LCD panel a bit and disconnect the connector for the interface cable. If there is the kapton tape on the rear of the panel, remove it.



Step	Length (Quantity)	Memo
1	M2.5 x 6 mm (2)	
Note: Make sure you use the correct screw when replacing.		

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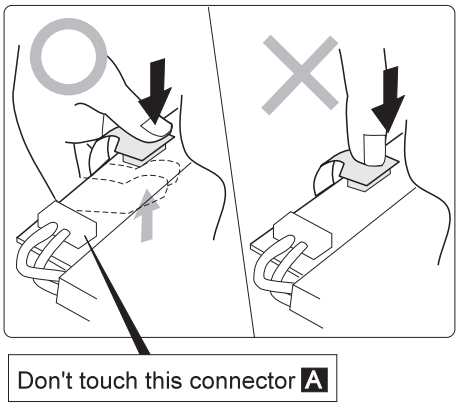
When replacing

Attention:

1. The inverter card is very sensitive. Connect the interface cable as shown. Flexing the inverter card with too much force seriously damages the card.
2. It is not safe to touch the inverter card connecter **A**. A loose or incorrect connection of the connector can cause a serious problem.



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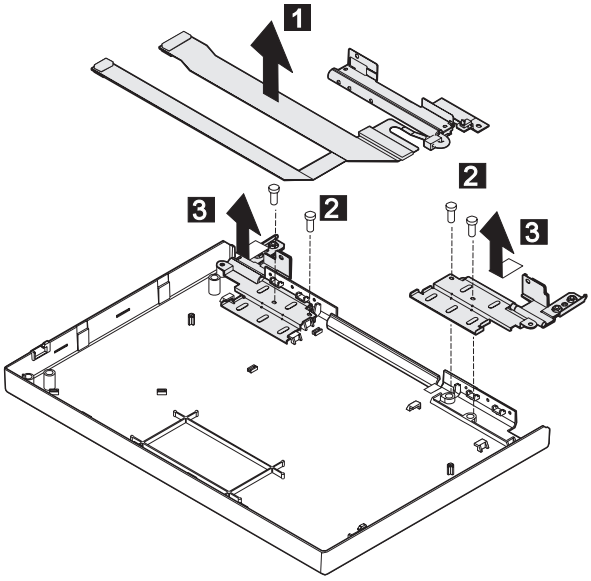
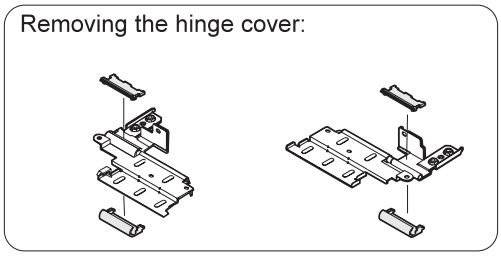
2030 Interface Cable Assembly, Hinges

- LCD Cover **(2010)**
- LCD Panel **(2020)**

1 : When replacing the interface cable assembly
2 , **3** : When replacing the hinges





Step	Length (Quantity)	Memo
2	M2 x 4.3 mm (4)	
Note: Make sure you use the correct screw when replacing.		

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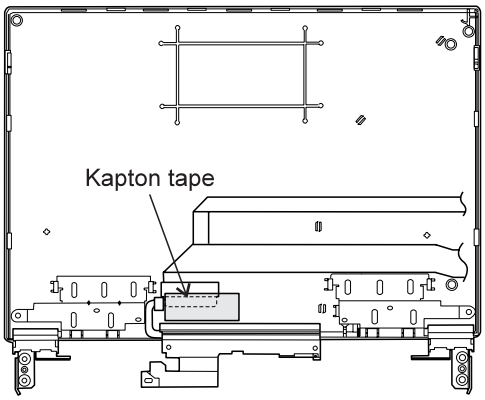
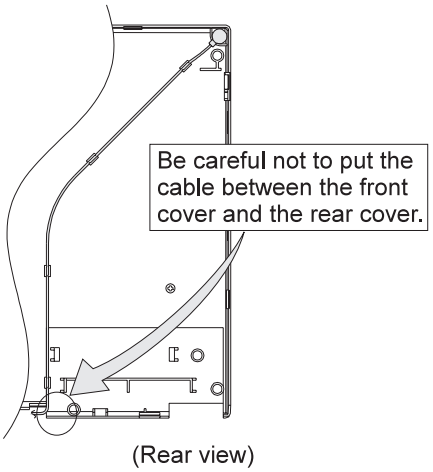
When replacing

Replace the kapton tape as shown below.



Position the microphone cable as shown.



(Rear view)

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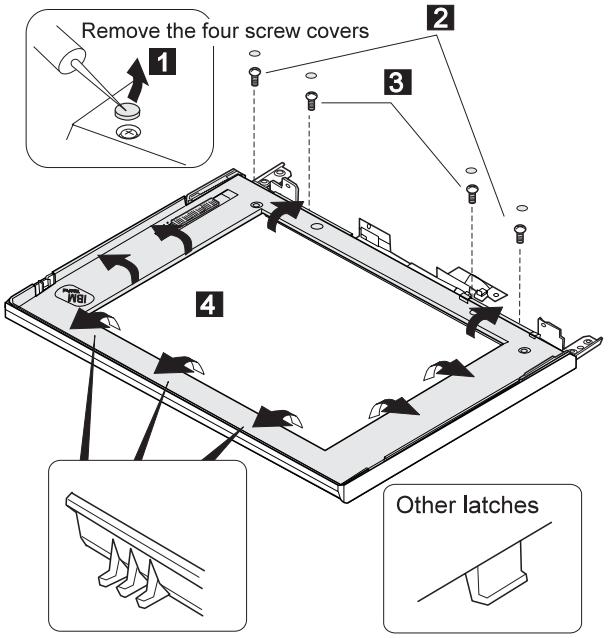
LCD Unit, 10.4 SVGA (P/N 29H9227)

3010 LCD Cover

Notes:

1. Be careful not to scratch the LCD cover when removing the screw covers 1 .
2. The LCD cover has several latches. Release these latches; then remove the LCD cover. Be careful not to break the latches.



Step	Length (Quantity)	Memo
2	M2.5 x 6 mm (2)	
3	M2 x 5 mm (2)	
Note: Make sure you use the correct screw when replacing.		

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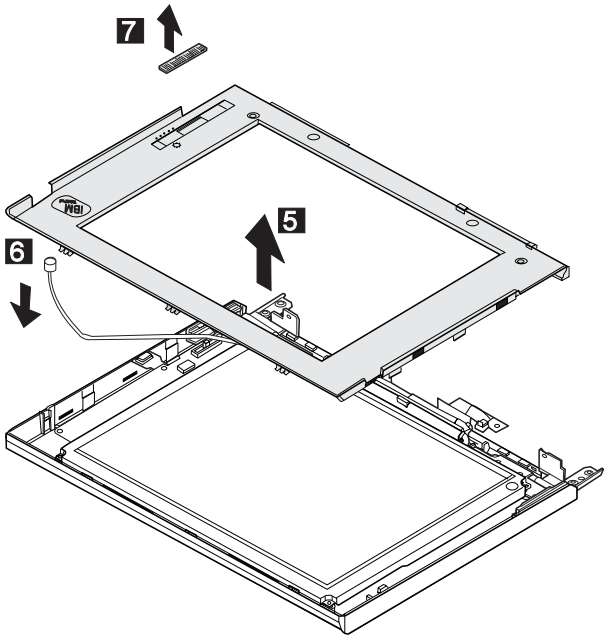
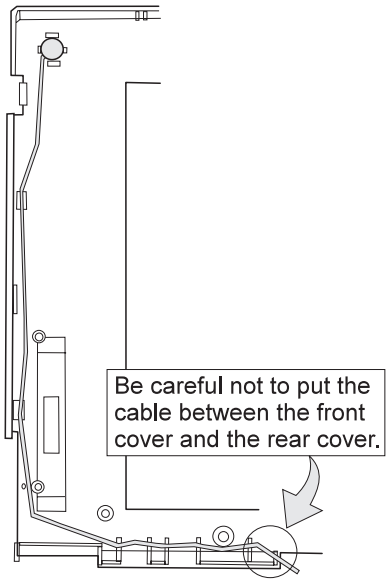
Lift the LCD front cover a bit; then remove the microphone cable.



When replacing

Position the microphone cable as shown.below.



(Rear view)

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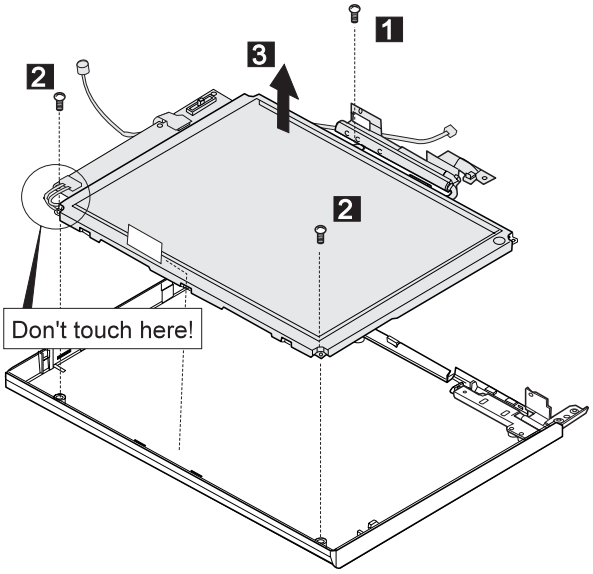
3020 LCD Panel, Interface Cable Assembly

- LCD Cover **(3010)**

Note

Be careful not to scratch or soil the surface of the LCD panel when replacing it.



Step	Length (Quantity)	Memo
1	M2.5 x 4 mm (1)	
2	M2 x 4.3 mm (2)	
Note: Make sure you use the correct screw when replacing.		

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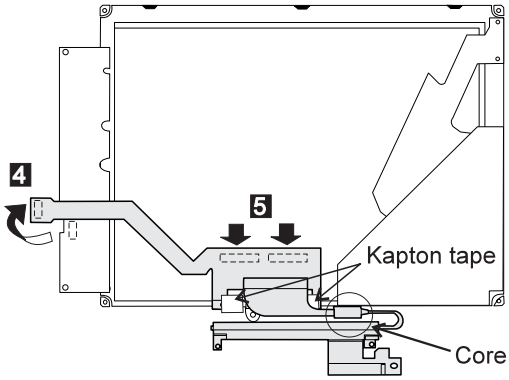
When removing the interface cable assembly, remove the kapton tape on the cable; then disconnect the three connecters as shown.



(Rear view)

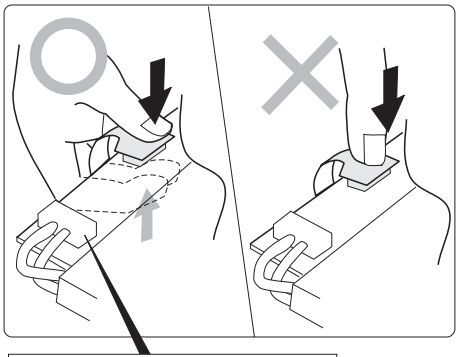
When replacing

Be careful not to place the core under the LCD panel.

When replacing

Attention:

1. The inverter card is very sensitive. Connect the interface cable as shown. Flexing the inverter card with too much force seriously damages the card.
2. It is not safe to touch the inverter card connecter A. A loose or incorrect connection of the connector can cause a serious problem.



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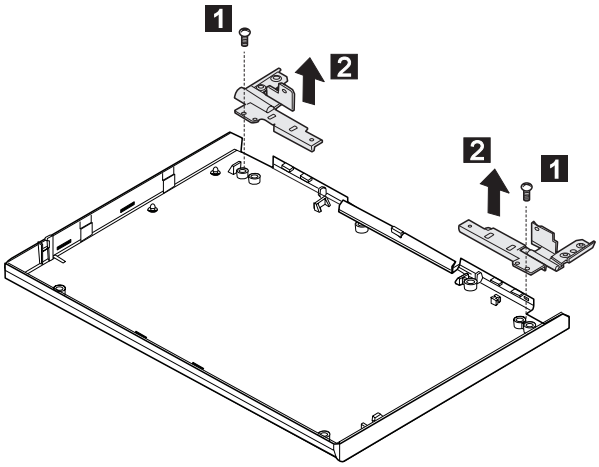
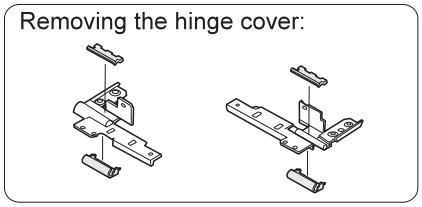
3030 Hinges

- LCD Cover **(3010)**
- LCD Panel **(3020)** (with interface cable assembly)





Step	Length (Quantity)	Memo
1	M2.5 x 4 mm (2)	
Note: Make sure you use the correct screw when replacing.		

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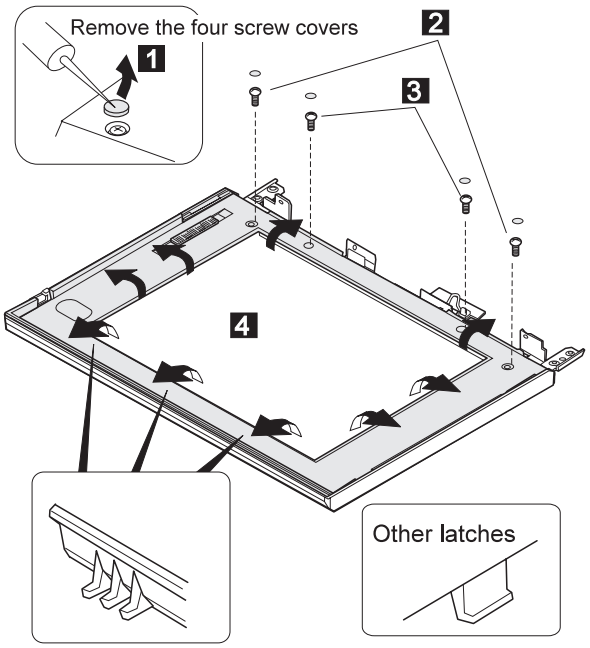
LCD Unit, 10.4 VGA (P/N 46H5355)

4010 LCD Cover

Notes:

1. Be careful not to scratch the LCD cover when removing the screw covers 1 .
2. The LCD cover has several latches. Release these latches; then remove the LCD cover. Be careful not to break the latches.



Step	Length (Quantity)	Memo
2	M2.5 x 6 mm (2)	
3	M2 x 5 mm (2)	
Note: Make sure you use the correct screw when replacing.		

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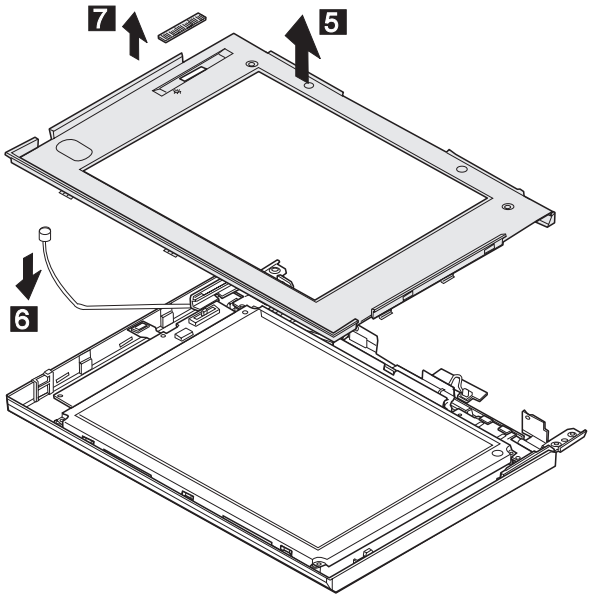
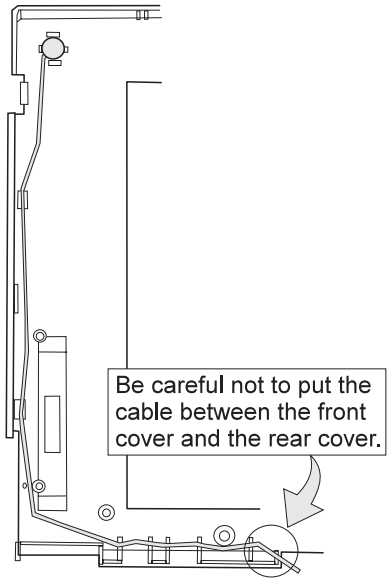
Lift the LCD front cover a bit; then remove the microphone cable.



When replacing

Position the microphone cable as shown.



(Rear view)

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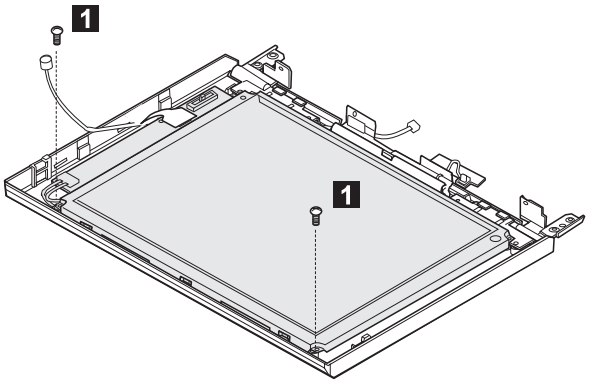
4020 LCD Panel

- LCD Cover **(4010)**

Note

Be careful not to scratch or soil the surface of the LCD panel when replacing it.



Step	Length (Quantity)	Memo
1	M2 x 4.3 mm (2)	
Note: Make sure you use the correct screw when replacing.		

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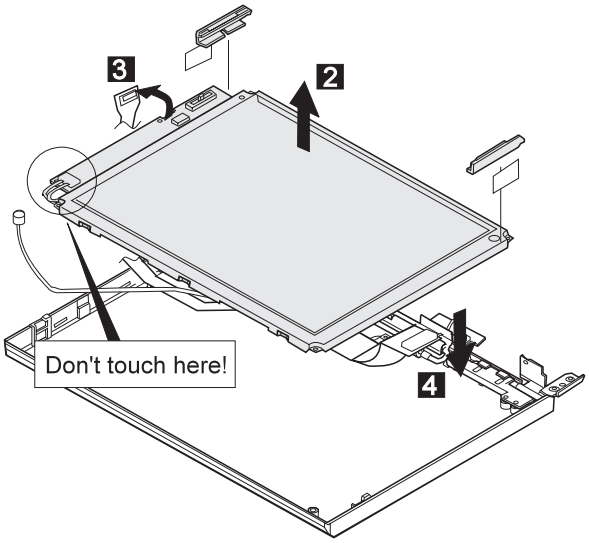
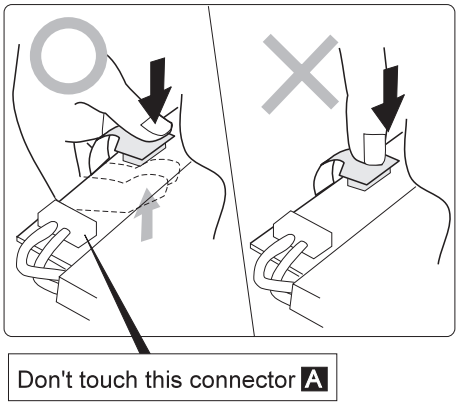
Lift the LCD panel slightly 2 ; then disconnect the flexible cable 3 and 4 .



When replacing

Attention:

1. The inverter card is very sensitive. Connect the interface cable as shown. Flexing the inverter card with too much force seriously damages the card.
2. It is not safe to touch the inverter card connecter A . A loose or incorrect connection of the connector can cause a serious problem.



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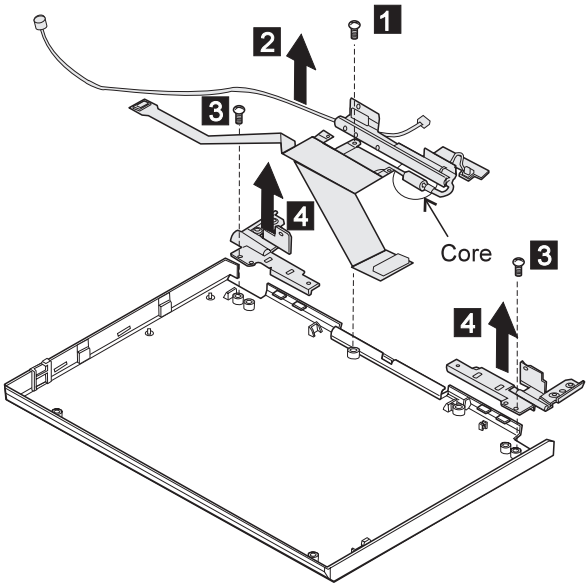
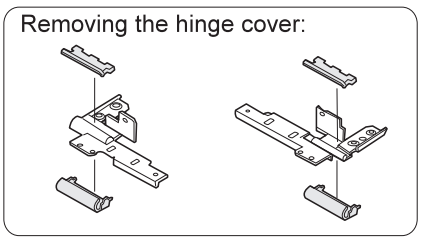
4030 Interface Cable Assembly, Hinges

- LCD Cover **(4010)**
- LCD Panel **(4020)**

1 , 2 : When replacing the interface cable assembly

3 , 4 : When replacing the hinges





Step	Length (Quantity)	Memo
1 3	M2.5 x 4 mm (3)	
Note: Make sure you use the correct screw when replacing.		

When replacing

Don't locate the core under the LCD panel.

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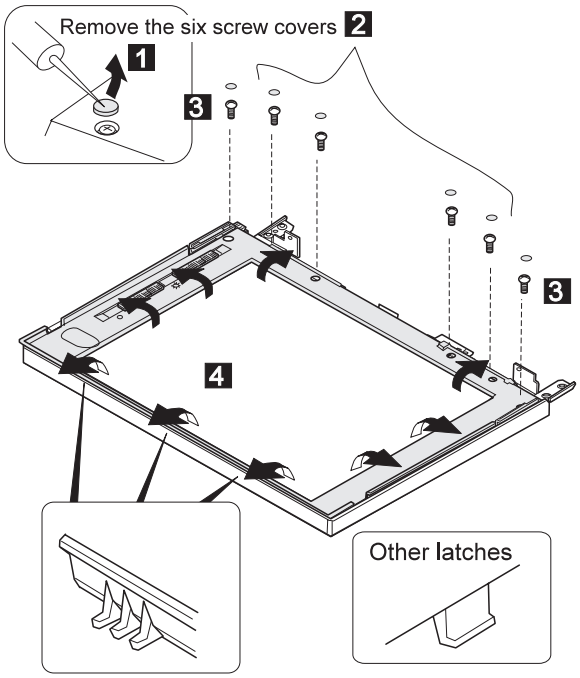
LCD Unit, 11.3 DSTN (P/N 39H6232)

5010 LCD Cover

Notes:

1. Be careful not to scratch the LCD cover when removing the screw covers 1 .
2. The LCD cover has several latches. Release these latches; then remove the LCD cover. Be careful not to break the latches.



Step	Length (Quantity)	Memo
2	M2.5 x 6 mm (4)	
3	M2.5 x 9 mm (2)	
Note: Make sure you use the correct screw when replacing.		

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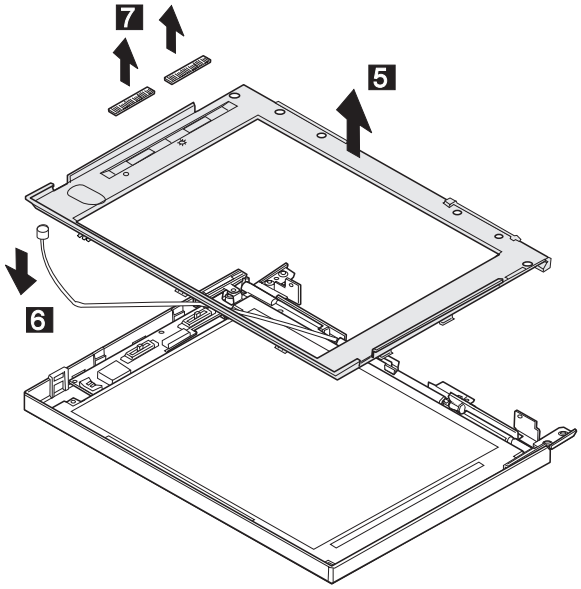
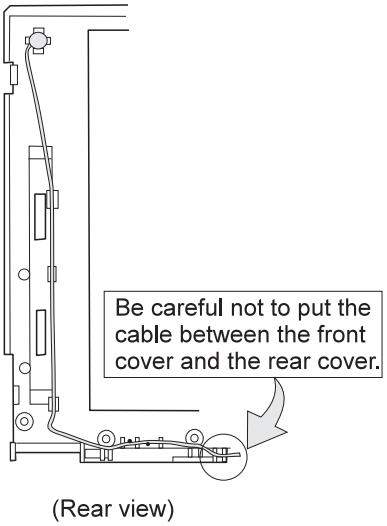
Lift the LCD front cover a bit; then remove the microphone cable.



When replacing

Position the microphone cable as shown.



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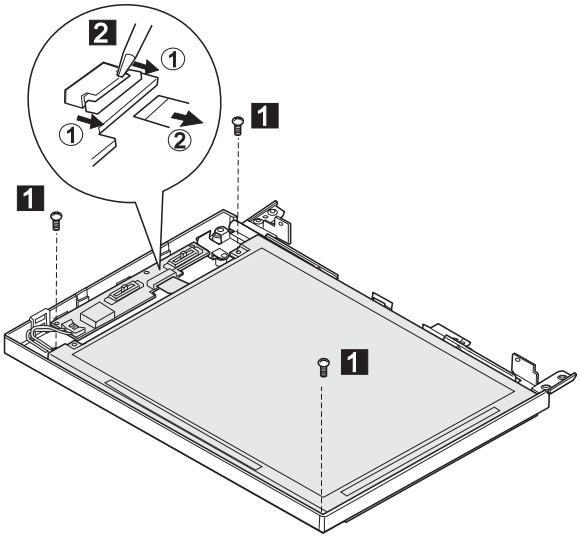
5020 LCD Panel

- LCD Cover **(5010)**

Note

Be careful not to scratch or soil the surface of the LCD panel when replacing it.



Step	Length (Quantity)	Memo
1	M2.5 x 6 mm (3)	
Note: Make sure you use the correct screw when replacing.		

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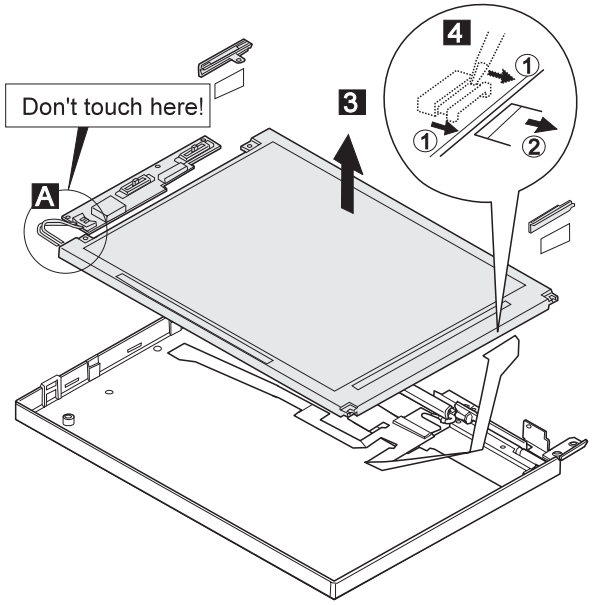
Lift the LCD panel slightly 3 , then disconnect the flexible cable 4 .



When replacing

Attention: It is not safe to touch the inverter card connecter A . A loose or incorrect connection of the inverter card connector A can cause a serious problem. When replacing the inverter card, **make sure the connector is connected correctly**.

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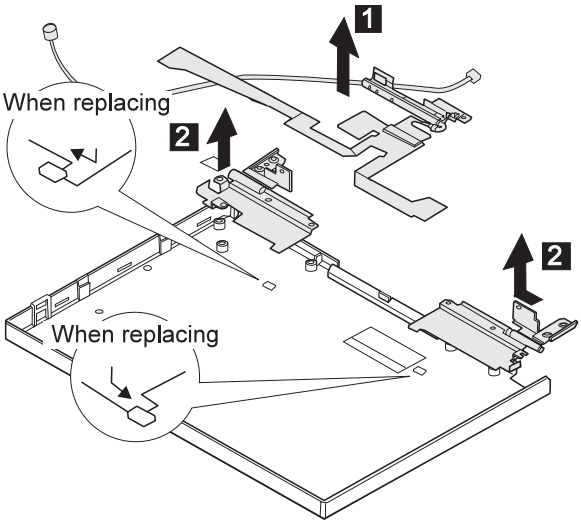
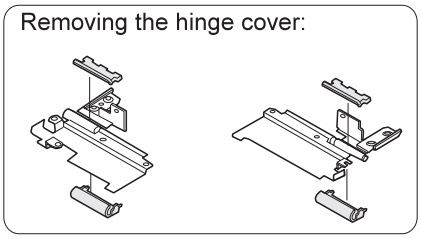
5030 Interface Cable Assembly, Hinges

- LCD Cover **(5010)**
- LCD Panel **(5020)**

1 : When replacing the interface cable assembly
2 : When replacing the hinges





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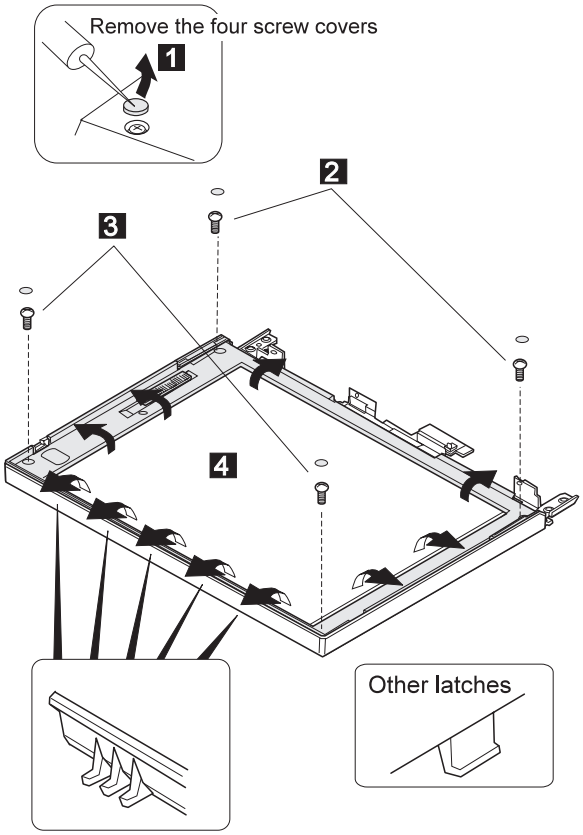
LCD Unit, 12.1 XGA

P/N 46H5735, ASM P/N 46H5731

6010 LCD Cover

Notes:

1. Be careful not to scratch the LCD cover when removing the screw covers 1 .
2. The LCD cover has several latches. Release these latches; then remove the LCD cover. Be careful not to break the latches.



Step	Length (Quantity)	Memo
2	M2.5 x 9 mm (2)	
3	M2.5 x 6 mm (2)	
Note: Make sure you use the correct screw when replacing.		

Lift the LCD front cover a bit; then remove the microphone cable.

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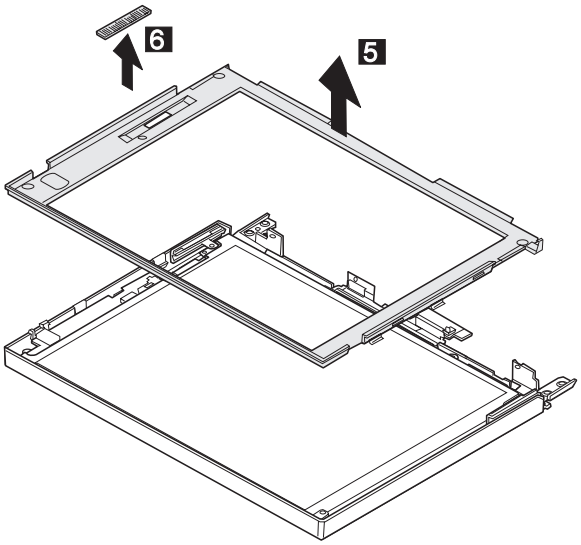

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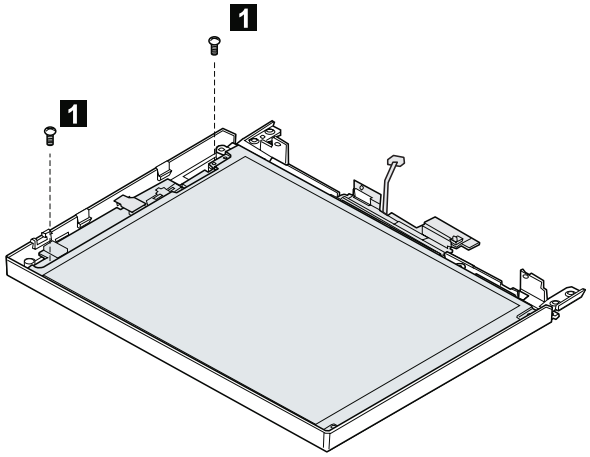
6020 LCD Panel

- LCD Cover **(6010)**

Note

Be careful not to scratch or soil the surface of the LCD panel when replacing it.



Step	Length (Quantity)	Memo
1	M2.5 x 6 mm (2)	
Note: Make sure you use the correct screw when replacing.		

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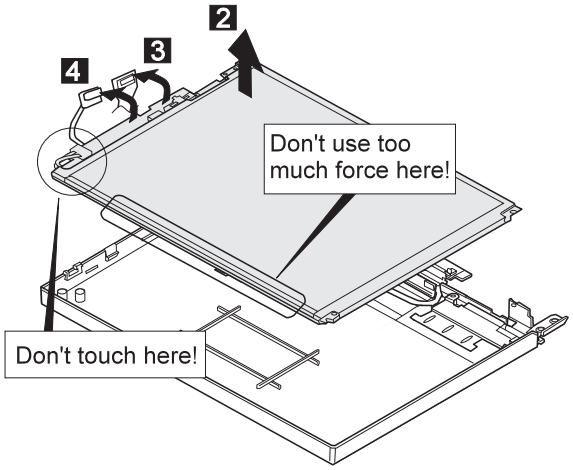
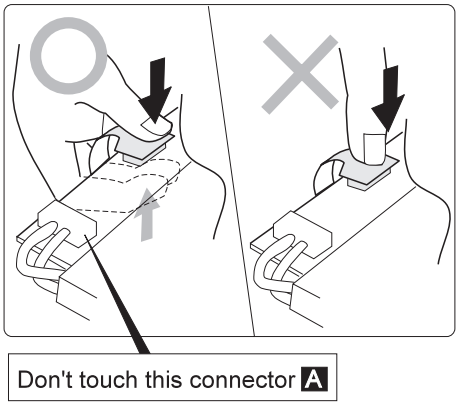
Lift the LCD panel slightly; then disconnect the interface cable connector.



When replacing

Attention:

1. The inverter card is very sensitive. Connect the interface cable as shown. Flexing the inverter card with too much force seriously damages the card.
2. It is not safe to touch the inverter card connecter A. A loose or incorrect connection of the connector can cause a serious problem.



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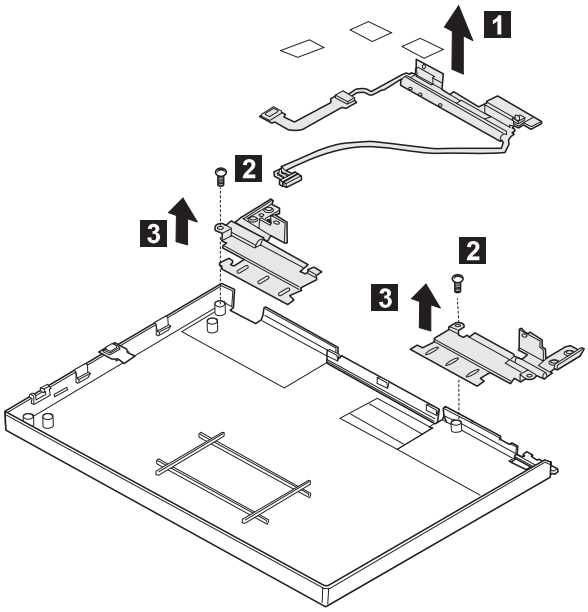
6030 Interface Cable Assembly, Hinges

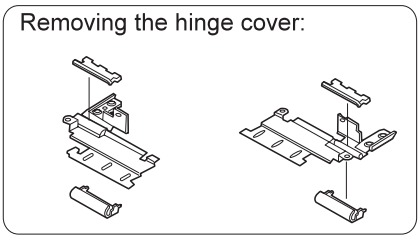
- LCD Cover **(6010)**
- LCD Panel **(6020)**

1 : When replacing the interface cable assembly

2 , **3** : When replacing the hinges

Remove the kapton tape in step **1** .





Step	Length (Quantity)	Memo
2	M2.5 x 4 mm (2)	
Note: Make sure you use the correct screw when replacing.		

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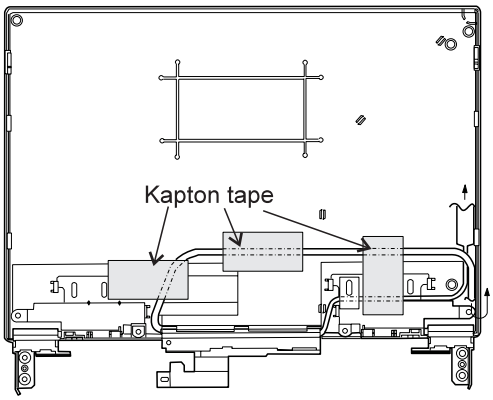
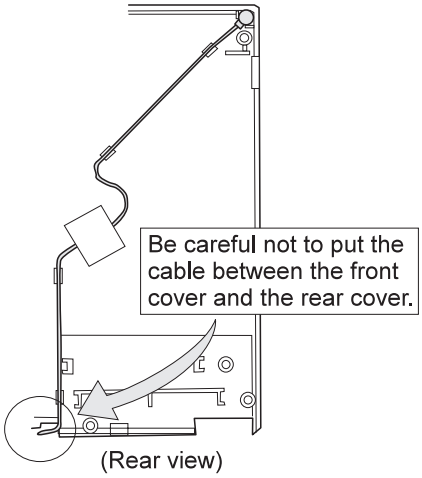
When replacing

Replace the kapton tape as shown below.



Position the microphone cable as shown.



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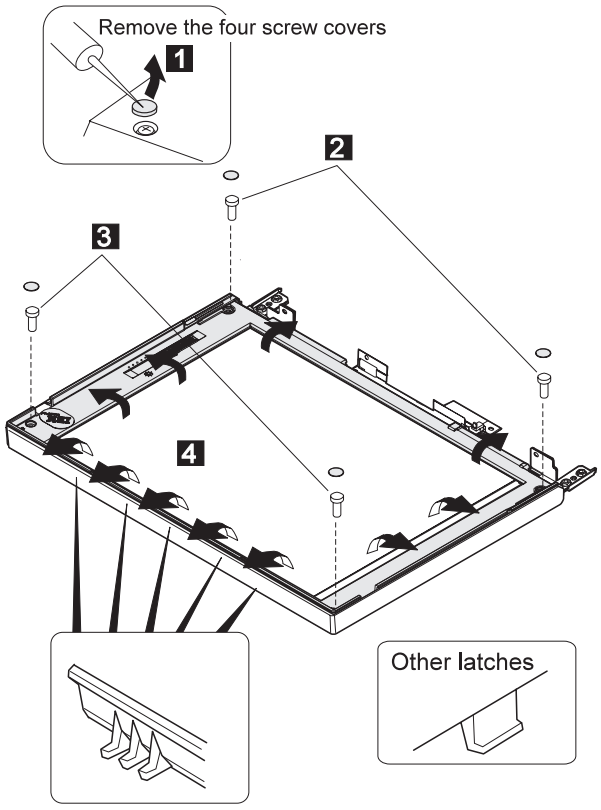
LCD Unit, 12.1 SVGA (P/N 82H8496)

7010 LCD Cover

Notes:

1. Be careful not to scratch the LCD cover when removing the screw covers 1 .
2. The LCD cover has several latches. Release these latches; then remove the LCD cover. Be careful not to break the latches.



Step	Length (Quantity)	Memo
2	M2.5 x 9 mm (2)	
3	M2.5 x 6 mm (2)	
Note: Make sure you use the correct screw when replacing.		

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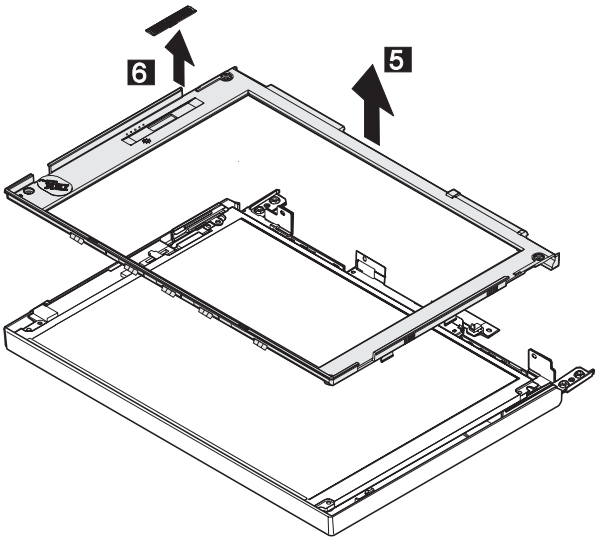
Lift the LCD front cover a bit; then remove the microphone cable.



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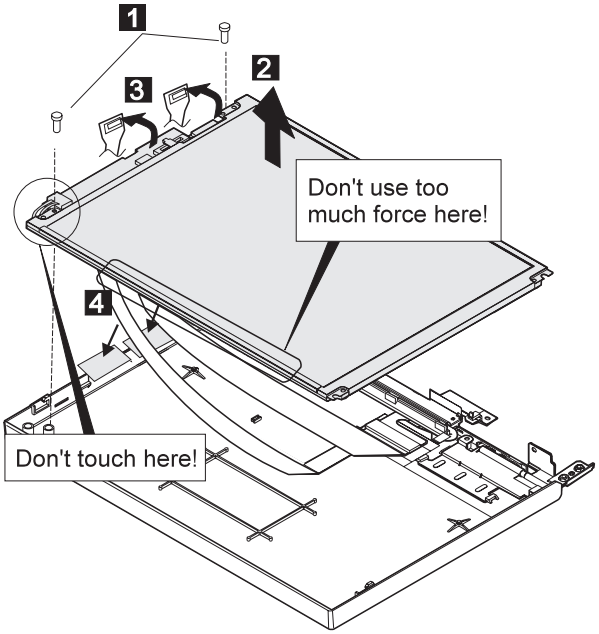
7030 LCD Panel

- LCD Cover **(7010)**

Note

Be careful not to scratch or soil the surface of the LCD panel when replacing it.

Lift the LCD panel a bit and disconnect the connector for the interface cable. If there is the kapton tape on the rear of the panel, remove it.



Step	Length (Quantity)	Memo
1	M2.5 x 6 mm (2)	
Note: Make sure you use the correct screw when replacing.		

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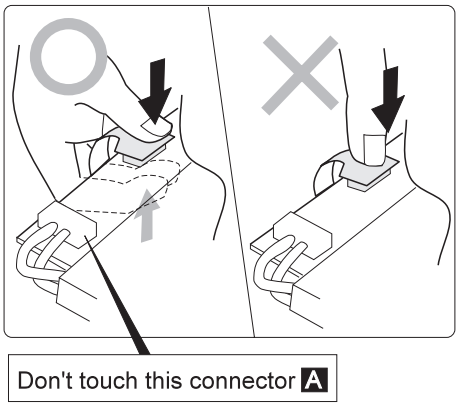
When replacing

Attention:

1. The inverter card is very sensitive. Connect the interface cable as shown. Flexing the inverter card with too much force seriously damages the card.
2. It is not safe to touch the inverter card connecter **A**. A loose or incorrect connection of the connector can cause a serious problem.



Don't touch this connector **A**

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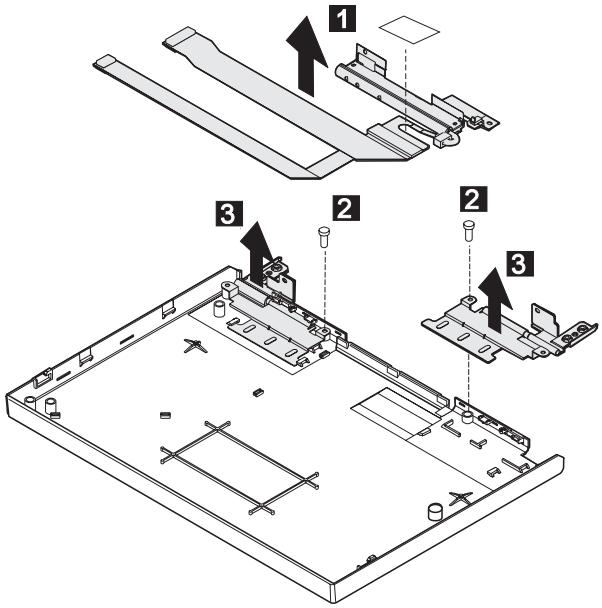
7040 Interface Cable Assembly, Hinges

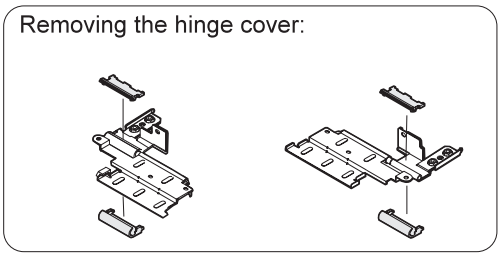
- LCD Cover **(7010)**
- LCD Panel **(7020)**

  1 : When replacing the interface cable assembly

  2 , **3** : When replacing the hinges

Remove the kapton tape in step **1** .





Step	Length (Quantity)	Memo
2	M2.5 x 4 mm (2)	
Note: Make sure you use the correct screw when replacing.		

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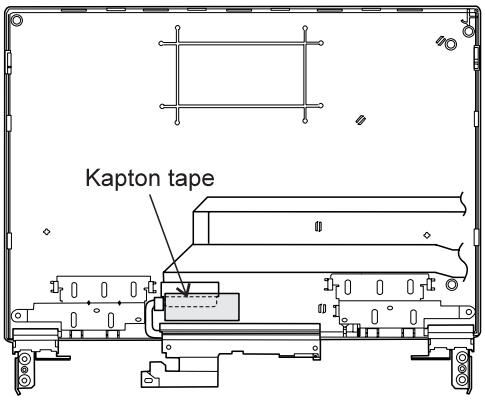
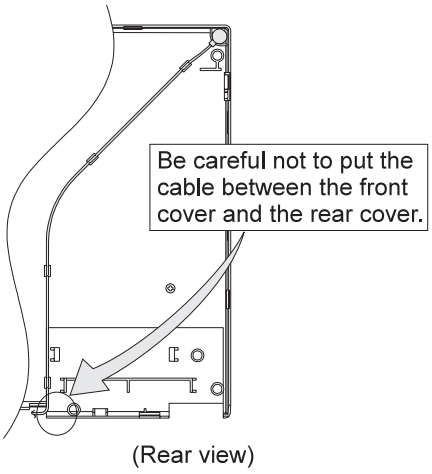
When replacing

Replace the kapton tape as shown below.



Position the microphone cable as shown below.



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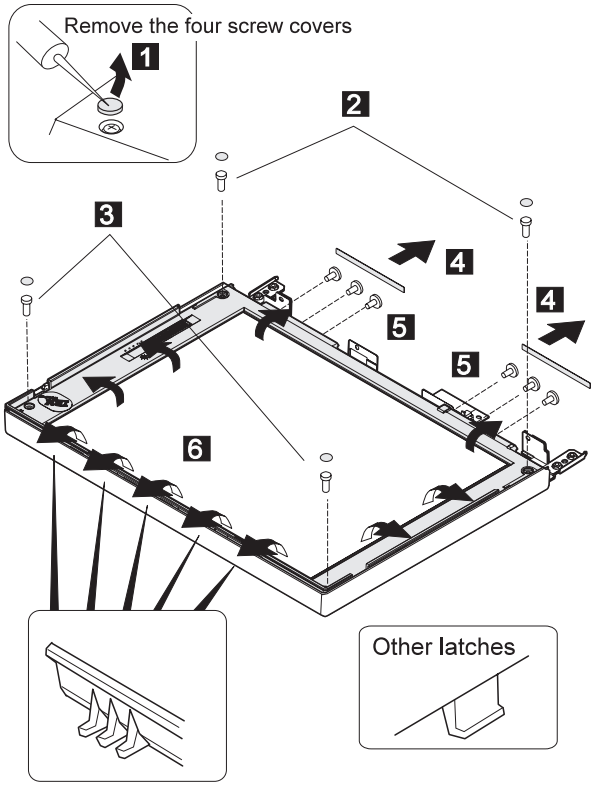
LCD Unit, 12.1 SVGA (P/N 11J8867, ASM P/N 11J8855)

8010 LCD Cover

Notes:

1. Be careful not to scratch the LCD cover when removing the screw covers 1 .
2. The LCD cover has several latches. Release these latches; then remove the LCD cover. Be careful not to break the latches.



Step	Length (Quantity)	Memo
2	M2.5 x 9 mm (2)	
3	M2.5 x 6 mm (2)	
5	M2 x 4.3 mm (6)	Flat head
Note: Make sure you use the correct screw when replacing.		

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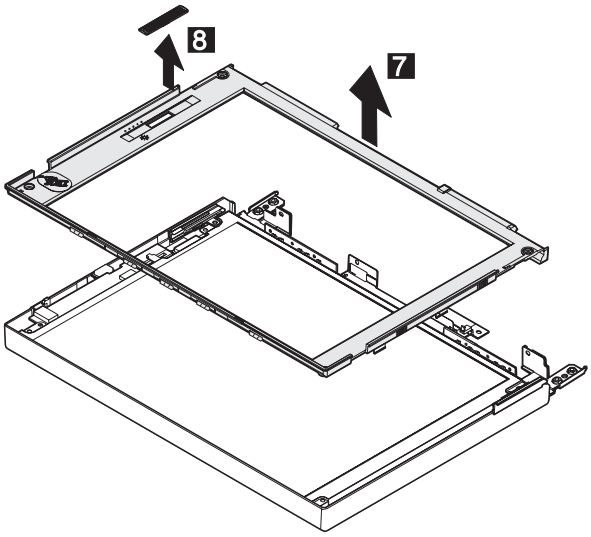
Lift the LCD front cover a bit; then remove the microphone cable.



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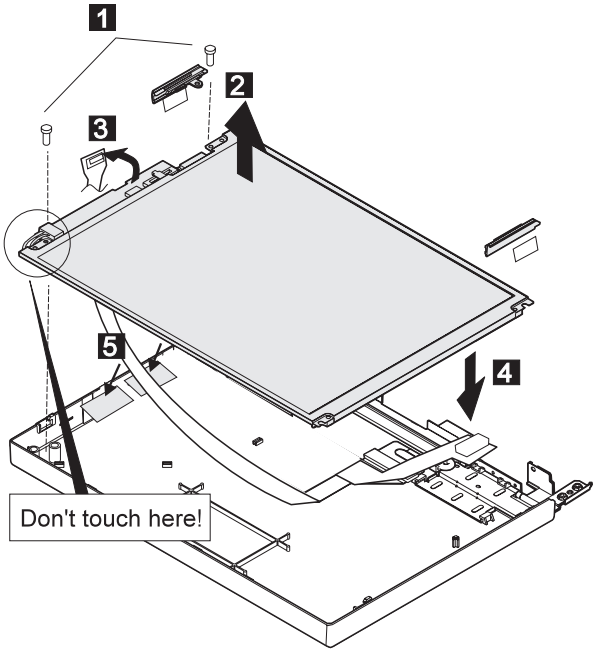
8020 LCD Panel

- LCD Cover **(8010)**

Note

Be careful not to scratch or soil the surface of the LCD panel when replacing it.

Lift the LCD panel a bit and disconnect the connector for the interface cable. If there is the kapton tape on the rear of the panel, remove it.



Step	Length (Quantity)	Memo
1	M2.5 x 6 mm (2)	
Note: Make sure you use the correct screw when replacing.		

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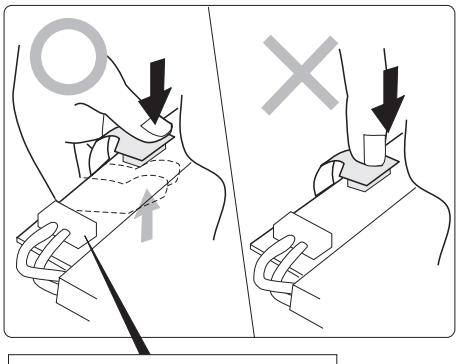
When replacing

Attention:

1. The inverter card is very sensitive. Connect the interface cable as shown. Flexing the inverter card with too much force seriously damages the card.
2. It is not safe to touch the inverter card connecter A. A loose or incorrect connection of the connector can cause a serious problem.



Don't touch this connector A

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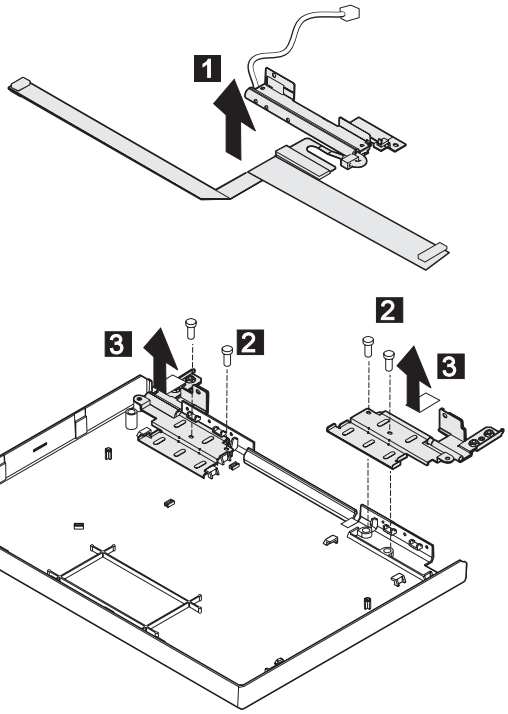
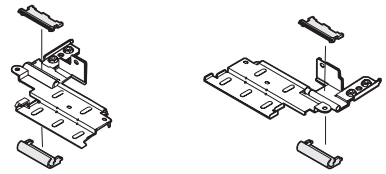
8030 Interface Cable Assembly, Hinges

- LCD Cover **(8010)**
- LCD Panel **(8020)**

1 : When replacing the interface cable assembly
2 , **3** : When replacing the hinges



Removing the hinge cover:



Step	Length (Quantity)	Memo
2	M2 x 4.3 mm (4)	
Note: Make sure you use the correct screw when replacing.		

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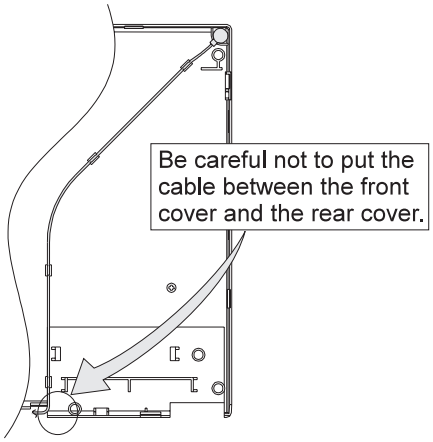
When replacing

Position the microphone cable as shown.



(Rear view)

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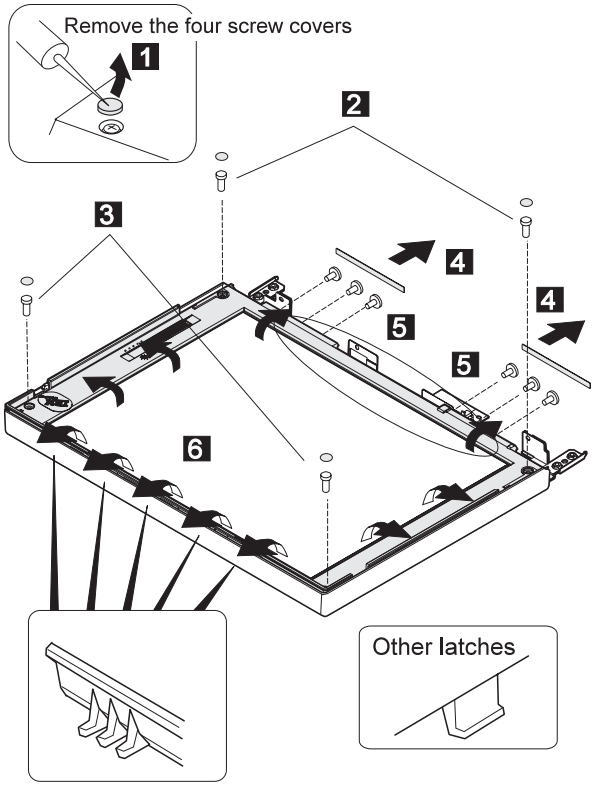
LCD Unit, 12.1 SVGA (P/N 46H5725, ASM P/N 46H5723)

9010 LCD Cover

Notes:

1. Be careful not to scratch the LCD cover when removing the screw covers 1 .
2. The LCD cover has several latches. Release these latches; then remove the LCD cover. Be careful not to break the latches.



Note: The front cover adhere to the LCD panel. The circle in the figure shows the adhesive part.

Step	Length (Quantity)	Memo
2	M2.5 x 9 mm (2)	
3	M2.5 x 6 mm (2)	
5	M2 x 4.3 mm (6)	Flat head
Note: Make sure you use the correct screw when replacing.		

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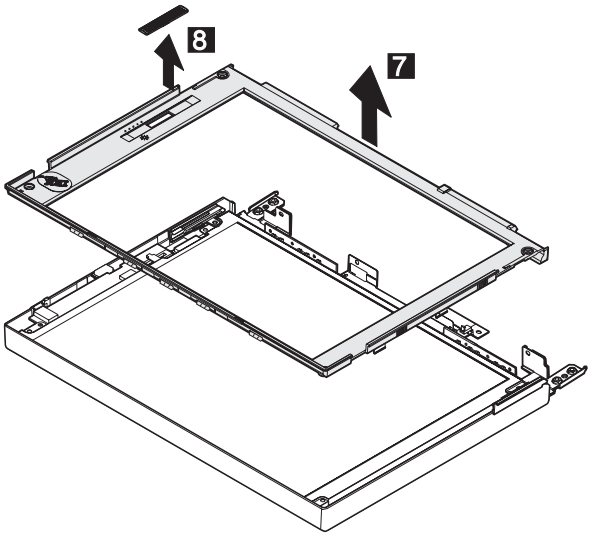
Lift the LCD front cover a bit; then remove the microphone cable.



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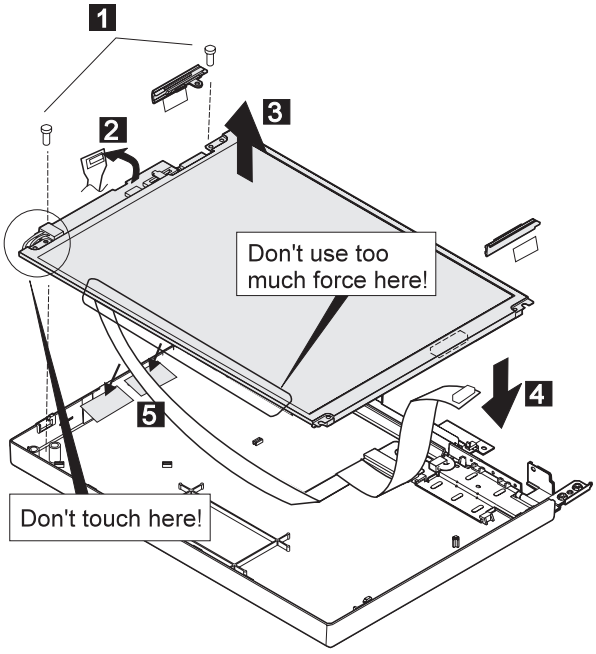
9020 LCD Panel

- LCD Cover **(9010)**

Note

Be careful not to scratch or soil the surface of the LCD panel when replacing it.

Lift the LCD panel a bit and disconnect the connector for the interface cable. If there is the kapton tape on the rear of the panel, remove it.



Step	Length (Quantity)	Memo
1	M2.5 x 6 mm (2)	
Note: Make sure you use the correct screw when replacing.		

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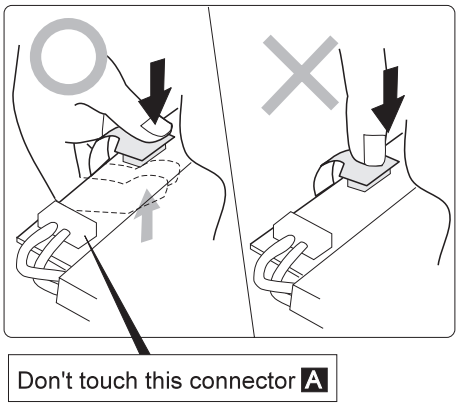
When replacing

Attention:

1. The inverter card is very sensitive. Connect the interface cable as shown. Flexing the inverter card with too much force seriously damages the card.
2. It is not safe to touch the inverter card connecter A. A loose or incorrect connection of the connector can cause a serious problem.



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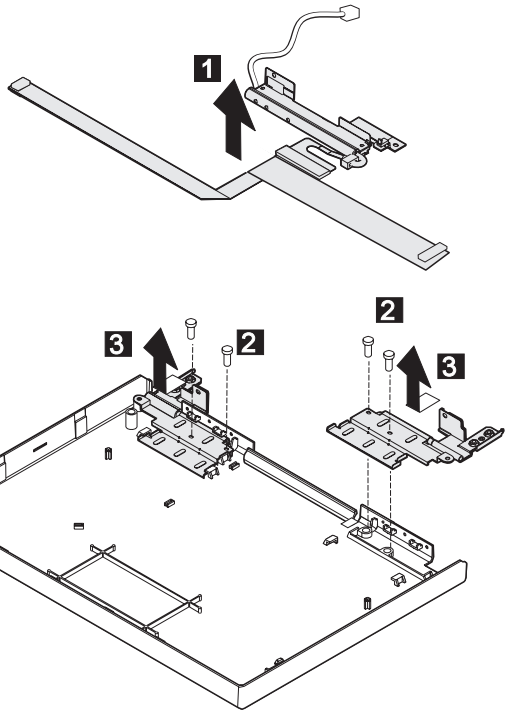
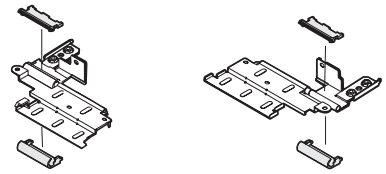
9030 Interface Cable Assembly, Hinges

- LCD Cover **(9010)**
- LCD Panel **(9020)**

1 : When replacing the interface cable assembly
2 , **3** : When replacing the hinges



Removing the hinge cover:



Step	Length (Quantity)	Memo
2	M2 x 4.3 mm (4)	
Note: Make sure you use the correct screw when replacing.		

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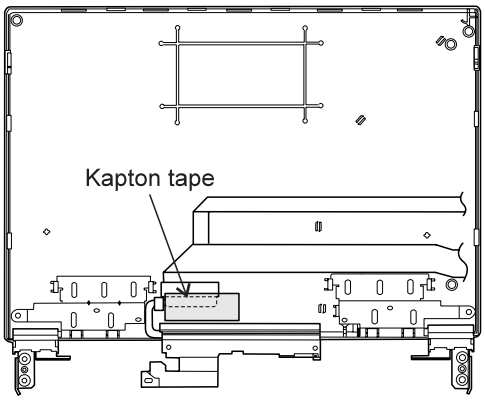
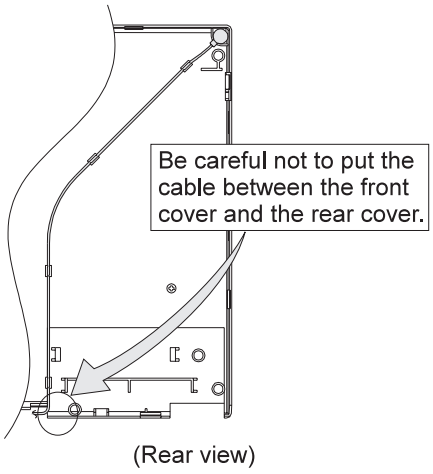
When replacing

Replace the kapton tape as shown below.



Position the microphone cable as shown.



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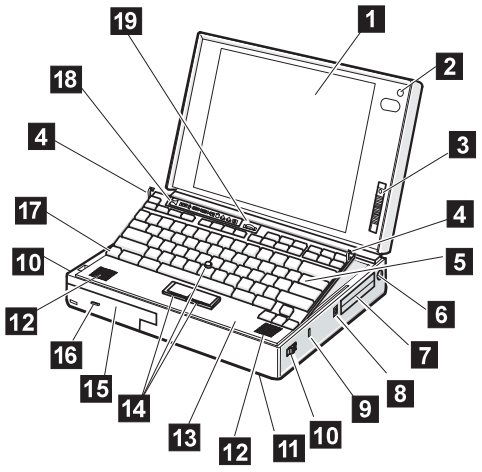
Locations

Front View

1 LCD
2 Built-in Microphone
3 Brightness Control
4 Keyboard Risers
5 Auto Tilt Keyboard
6 External-Input-Device Connector
7 PCMCIA Slot
8 PCMCIA Slot
9 Security Keyhole
10 Release Latches
11 Front Infrared Port
12 Built-in Speaker
13 Front Palm Rest
14 TrackPoint III
15 Removable Diskette Drive or CD-ROM Drive (model-unique)
16 CD-ROM Eject Button (CD-ROM model)
17 **Fn** Key
18 LCD Indicator Panel
19 Volume Control



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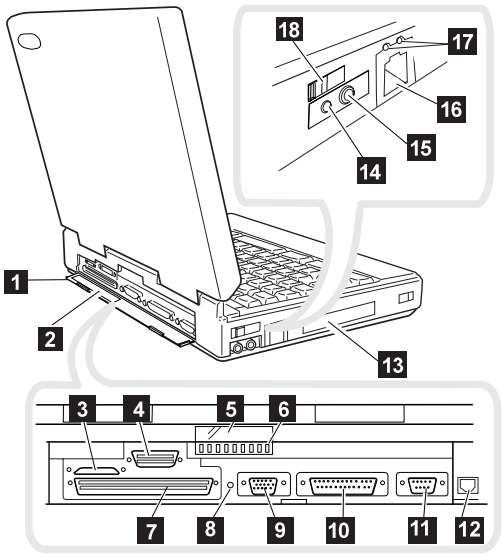
Rear View

1. Rear Door
2. Connector Door
3. MIDI/Joystick Port (model-unique)
4. External Diskette Drive Connector (model-unique)
5. Rear Infrared Port
6. Air Duct (Model unique)
7. System Expansion Connector
8. Power Shutdown Switch
9. External Display Connector
10. Parallel Connector
11. Serial Connector
12. Power Jack
13. Option Cover
14. Headphone Jack
15. Microphone/Line-in Jack
16. Modem/Fax Port
17. Video In/Out Ports (model-unique)
18. Power Switch



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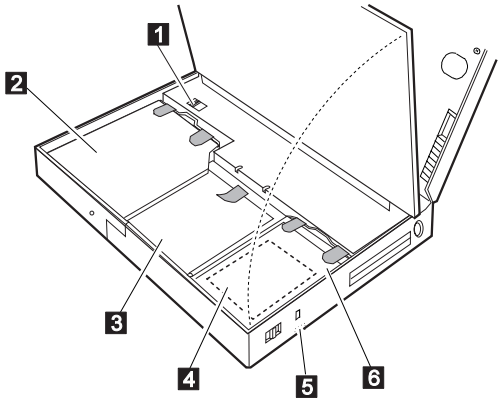
Inside View

1. Modem/Fax Port Release Latch
2. UltraBay
3. Battery Pack
4. Memory Slot
5. Security Latch
6. Removable Hard Disk Drive



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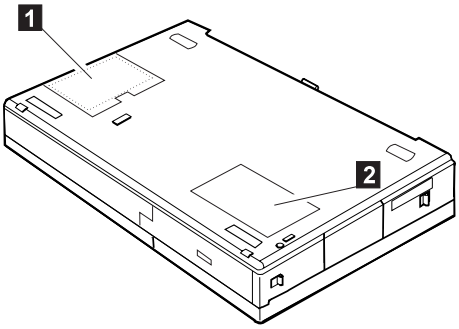
Bottom View

1 Memory Slot (Model unique)
2 Serial Number



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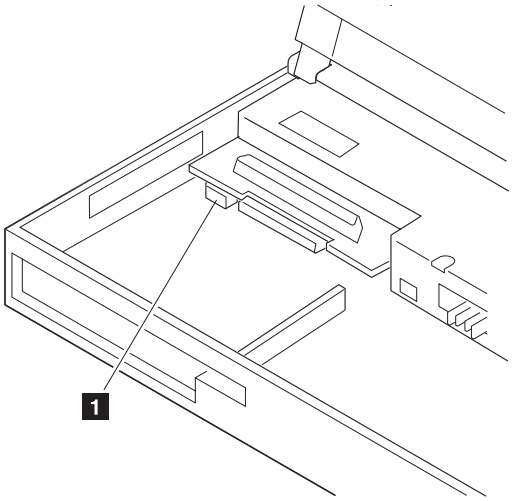
Power-On Password Connector



1 : Power-On Password Connector

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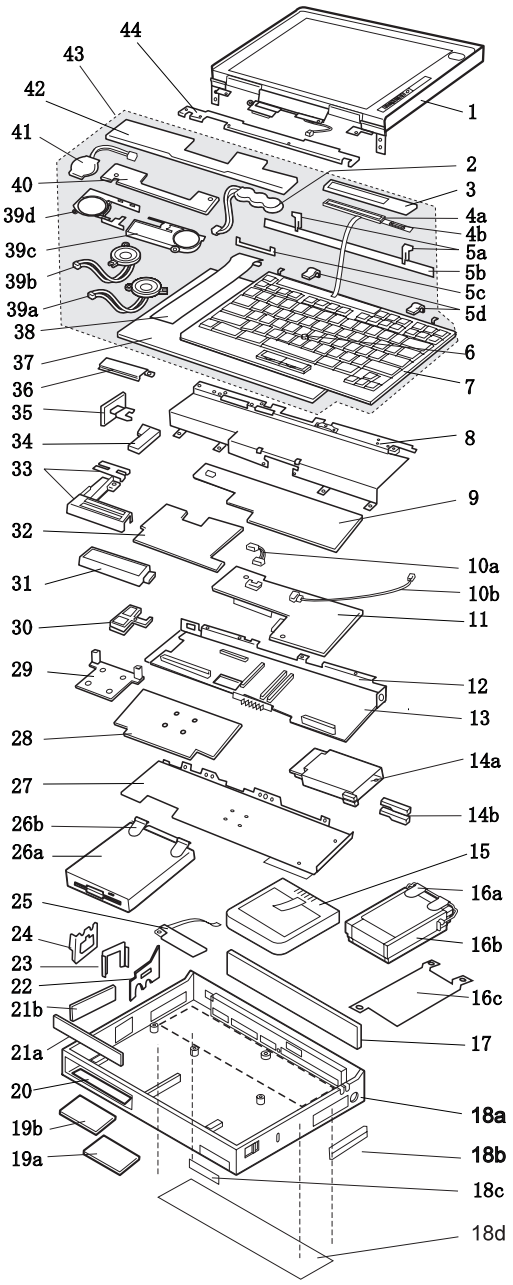
Parts Listing 760 (9546, 9547)



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Index	*Part (760C)*	
1	LCD Assembly (12.1 TFT) (U.S.-9546, model U21, U27, U28, U2A) U2H, U2J)	29H9226
	LCD Assembly (10.4 TFT) (U.S.-9546, model U22, U2B)	29H9227
2	Standby Battery	29H9497
3	LCD Indicator Assembly Cover	69H8403
4a	LCD Indicator Assembly	29H9220
4b	Volume Knob	69H8404
5a	See Keyboard Misc. parts	
5b	Keyboard Foot	39H7038
5c	Keyboard FPC Bracket	39H7035
5d	See Keyboard Misc. parts	
6	TrackPoint III Cap	84G6536
7	Keyboard (See Keyboard Section)	
8	Upper Shield Case	29H9212
9	Video Card	29H9207
10a	Volume Connection Cable	29H9211
10b	Mic Connection Cable	29H9210
11	DSP Card	29H9205
12	Rear Shield Case	29H9200
13	System Board	29H9199
14a	PC Card Slot	39H7019
14b	Eject Button	39H7018
15	Battery Pack (Li-ion)	29H9232
16a	HDD Removable Strap	29H9236
16b	Hard Disk Drive (720 MB, 12.7 mm) (U.S.-9546, model U21, U22, U27, U2A) U2B, U2H)	29H9229
	Hard Disk Drive (1.08 GB, 12.7 mm) (U.S.-9546, model U28, U2J)	29H9367
16c	EMI Sheet	39H7031
17	Rear Connector Door	29H9185
18a	Base Cover-W/W	29H9181
	Base Cover-Japan	39H7056
18b	PC Card Door	29H9238
18c	Name Label	66G9228
18d	Thermal Rubber Sheet	82H8966
19a	DIMM Cover	69H8422
19b	DIMM Adapter Card	29H9296
20	Lower Spacer	29H9194
21a	FDD Blank Bezel	29H9239
	FDD Bezel	29H9196
21b	Option Cover	29H9193
22	AV Cover	29H9189
23	Modem Cover Lock	39H7028
24	Modem Cover	39H7030
	Blank Cover for EMEA	29H9187
25	Front IR Assembly	29H9215
26a	Diskette Drive (3-mode)	29H9230
26b	Diskette Drive Removable Strap	29H9237
27	Lower Shield	29H9202

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Index	*Part (760C)*	
28	CPU Card (90 MHz, Pentium) (U.S.-9546, model U21, U22, U2A, U2B)	29H9198
	CPU Card (120 MHz, Pentium) (U.S.-9546, model U27, U28, U2H, U2J)	29H9297
29	Heat Sink (Pentium 90MHz) (U.S.-9546, model U21, U22, U2A, U2B)	39H7005
	Heat Sink (Pentium 120MHz) (U.S.-9546, model U27, U28, U2H, U2J)	39H7006
30	See Misc. Parts	
31	Internal DAA Assembly	12J1571
32	DC/DC Card	83H5375
33	See Misc. Parts	
34	Power Switch Actuator	29H9209
35	Power Switch Button	29H9191
36	Rear IR Assembly	29H9214
37	Keyboard Base	29H9218
38	Keyboard Cable	29H9222
39a	Speaker (right)	29H9225
39b	Speaker (left)	39H6983
39c	Speaker Holder (right)	39H7033
39d	Speaker Holder (left)	39H7034
40	Keyboard Card	29H9221
41	Backup Battery	29H9506
42	Palm Rest	29H9219
43	Keyboard Unit (See Keyboard Unit Section)	
44	Top Cover	29H9183
	AC Adapter (35W)	12J1448
	For Japan	12J1446
	Keyboard Misc. Parts	39H7105
	Misc. Parts (Includes the following:) Modem Holder Modem Lever DSP Holder Rear IR Lens	29H9234

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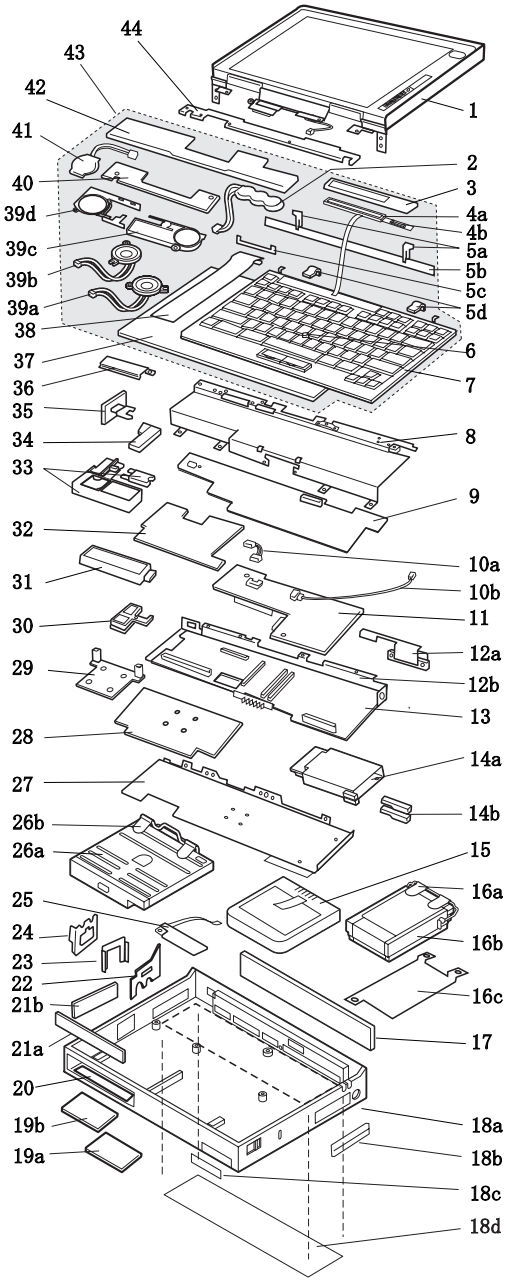
Model 760CD



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Index	*Part (760CD)*	
1	LCD Assembly (12.1 TFT)	29H9226
2	Standby Battery	29H9497
3	LCD Indicator Assembly Cover	69H8403
4a	LCD Indicator Assembly	29H9220
4b	Volume Knob	69H8404
5a	See Keyboard Misc. Parts	
5b	Keyboard Foot	39H7038
5c	Keyboard FPC Bracket	39H7035
5d	See Keyboard Misc. Parts	
6	TrackPoint III Cap	84G6536
7	Keyboard (See Keyboard Section)	
8	Upper Shield Case	29H9213
9	Video Card	83H7108
10a	Volume Connection Cable	29H9211
10b	Mic Connection Cable	29H9210
11	DSP Card	29H9205
12a	External Diskette Drive Connector	29H9203
12b	Rear Shield Case	29H9201
13	System Board	29H9199
14a	PC Card Slot	39H7019
14b	Eject Button	39H7018
15	Battery Pack (Li-ion)	29H9232
16a	HDD Removable Strap	29H9236
16b	Hard Disk Drive (1.2 GB, 17 mm) (U.S.-9546, model U11, U13, U1A, U1C)	29H9228
	Hard Disk Drive (720 MB, 12.7 mm)	29H9229
16c	EMI Sheet	39H7031
17	Rear Connector Door	29H9186
18a	Base Cover-W/W	29H9182
	Base Cover-Japan	39H7059
18b	PC Card Door	29H9238
18c	Name Label	66G9228
18d	Thermal Rubber Sheet	69H8429
19a	DIMM Cover	69H8422
19b	DIMM Adapter Card	29H9296
20	Lower Spacer	29H9194
21a	CD-ROM Blank Bezel	29H9289
	Diskette Drive Bezel	83H5431
21b	Option Cover	29H9193
22	AV Cover	29H9190
23	Modem Cover Lock	39H7027
24	Modem Cover	39H7029
	Blank Cover for EMEA	29H9188
25	Front IR Assembly	29H9215
26	CD-ROM Drive	29H9231
27	Lower Shield	29H9202

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Index	*Part (760CD)*	
28	CPU Card (90 MHz, Pentium)	29H9198
	(U.S.-9546, model U11, U1A)	
	CPU Card (120 MHz, Pentium)	29H9297
	(U.S.-9546, model U13, U1C)	
29	Heat Sink (Pentium 90MHz)	39H7005
	(U.S.-9546, model U11, U1A)	
	Heat Sink (Pentium 120MHz)	39H7006
	(U.S.-9546, model U13, U1C)	
30	See Misc. Parts	
31	Internal DAA Assembly	12J1571
32	DC/DC Card	83H5375
33	See Misc. Parts	
34	Power Switch Actuator	29H9209
35	Power Switch Button	29H9192
36	Rear IR Assembly	29H9214
37	Keyboard Base	29H9218
38	Keyboard Cable	29H9222
39a	Speaker (right)	29H9225
39b	Speaker (left)	39H6983
39c	Speaker Holder (right)	39H7033
39d	Speaker Holder (left)	39H7034
40	Keyboard Card	29H9221
41	Backup Battery	29H9506
42	Palm Rest	29H9219
	For Japan	29H7032
43	Keyboard Unit (See Keyboard Unit Section)	
44	Top Cover	29H9184

	Diskette Drive (3-mode)	29H9230
	Diskette Drive (4-mode, Japan)	29H9372
	Diskette Drive Removable Strap	29H9237
	Conversion Cable, Game Port	29H9269
	Conversion Cable, Game Video	85G1897
	Wall Plug	85G2367
	Microphone	66G7871
	AC Adapter (35W)	12J1448
	For Japan	12J1446
	Keyboard Misc. Parts	39H7105
	Misc. Parts	29H9235
	(Includes the following:)	
	Modem Holder	
	Modem Lever	
	DSP Holder	
	Rear IR Lens	
	S-Video Bracket	

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Keyboard Assembly

Arabic	29H9076
Belgian	29H9074
Canadian French	29H9082
Czech	29H9292
Danish	29H9073
Dutch	29H9071
French	29H9067
German	29H9065
Greek	29H9080
Hebrew	29H9077
Hungary	29H9291
Italian	29H9069
Japanese	29H9083
New World Spanish	29H9081
Norwegian	29H9075
Portuguese	29H9078
Polish	29H9290
Russian	29H9084
Slovak	29H9293
Spanish	29H9072
Swedish or Finnish	29H9070
Swiss	46H5989
Turkish	29H9079
U.K. English	29H9064
U.S. English	29H9063

Keyboard Unit

Arabic	29H9408
Belgian	29H9406
Canadian French	29H9414
Czech	39H6978
Danish	29H9405
Dutch	29H9403
French	29H9399
German	29H9397
Greek	29H9412
Hebrew	29H9409
Hungary	39H6977
Italian	29H9401
Japanese	29H9415
New World Spanish	29H9413
Norwegian	29H9407
Portuguese	29H9410
Polish	39H6976
Russian	29H9416
Slovak	39H6979
Spanish	29H9404
Swedish or Finnish	29H9402
Swiss	46H5990
Turkish	29H9411
U.K. English	29H9396
U.S. English	29H9395

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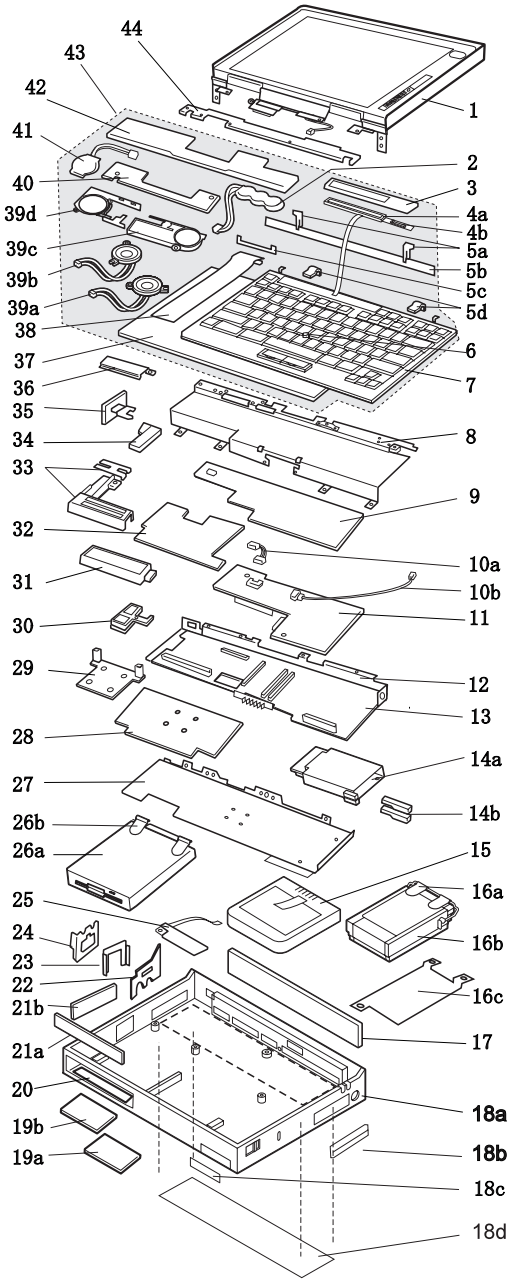
Model 760E (CD Nonupgradable Type)



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Check the Model

There are two models of 760E: Both come with an FDD built-in, but only one model is upgradable with an internal CD-ROM drive.

- The nonupgradable 760E model has the FDD built-in space that is thick enough to install only an FDD.
- The upgradable 760E model has the FDD built-in space that is thick enough to install a CD-ROM.

Verify the 760E model you are servicing before ordering FRU parts. **FRUs for the CD-ROM upgradable model are listed in the 760E (CD Upgradable Type) 760ED parts list. (See "Model 760E (CD Upgradable Type) or 760ED" on page 357.)**

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Index	*Part (760E CD Nonupgradable Type)*	
1	LCD Assembly (12.1 TFT)	29H9226
2	Standby Battery	29H9497
3	LCD Indicator Assembly Cover	69H8403
4a	LCD Indicator Assembly	29H9220
4b	Volume Knob	69H8404
5a	See Keyboard Misc. parts	
5b	Keyboard Foot	39H7038
5c	Keyboard FPC Bracket	39H7035
5d	See Keyboard Misc. parts	
6	TrackPoint III Cap	84G6536
7	Keyboard (See Keyboard Section)	
8	Upper Shield Case	29H9212
9	Video Card	39H6226
10a	Volume Connection Cable	29H9211
10b	Mic Connection Cable	29H9210
11	DSP Card	29H9205
12	Rear Shield Case	29H9200
13	System Board	11J8234
14a	PC Card Slot	46H6031
14b	Eject Button	46H6028
15	Battery Pack (Li-ion)	29H9232
16a	HDD Removable Strap	29H9236
16b	Hard Disk Drive (810 MB) (U.S.-9546, model U4B)	29H9366
	Hard Disk Drive (1.08 GB) (U.S.-9546, model U4A)	29H9367
16c	EMI Sheet	39H7031
17	Rear Connector Door	29H9185
18a	Base Cover	39H6249
	For Japan	39H6234
18b	PC Card Door	29H9238
18c	Name Label	66G9228
18d	Thermal Rubber Sheet	82H8966
19a	DIMM Cover	69H8422
19b	DIMM Adapter Card (8 MB) (U.S.-9546, model U4A)	83H7126
	DIMM Adapter Card (Blank) (U.S.-9546, model U4B)	83H7124
20	Lower Spacer	29H9194
21a	FDD Blank Bezel	29H9239
	FDD Bezel	29H9196
21b	Option Cover	29H9193

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Index	*Part (760E CD Nonupgradable Type)*	
22	AV Cover	29H9189
23	Modem Cover Lock	39H7028
24	Modem Cover	39H7030
	Blank Cover for EMEA	29H9187
25	Front IR Assembly	29H9215
26a	Diskette Drive (3-mode)	29H9230
	Diskette Drive (4-mode, for Japan)	29H9372
26b	Diskette Drive Removable Strap	29H9237
27	Lower Shield	29H9202
28	CPU Card (120 MHz, Pentium) (U.S.-9546, model U4B)	11J9672
	CPU Card (133 MHz, Pentium) (U.S.-9546, model U4A)	82H8897
29	Heat Sink	39H7006
30	See Misc. Parts	
31	Internal DAA Assembly	12J1571
32	DC/DC Card	83H5375
33	See Misc. Parts	
34	Power Switch Actuator	29H9209
35	Power Switch Button	29H9191
36	Rear IR Assembly	29H9214
37	Keyboard Base	29H9218
38	Keyboard Cable	29H9222
39a	Speaker (right)	29H9225
39b	Speaker (left)	39H6983
39c	Speaker Holder (right)	39H7033
39d	Speaker Holder (left)	39H7034
40	Keyboard Card	29H9221
41	Backup Battery	29H9506
42	Palm Rest	29H9219
	For Japan	39H7032
43	Keyboard Unit (See Keyboard Unit Section)	
44	Top Cover	29H9183
	AC Adapter (35W)	
	For U.S/Canada/LA/Japan	85G6705
	For EMEA/AP	12J1448
	Keyboard Misc. Parts	39H7105
	Misc. Parts	29H9234
	(Includes the following:)	
	Modem Holder	
	Modem Lever	
	DSP Holder	
	Rear IR Lens	

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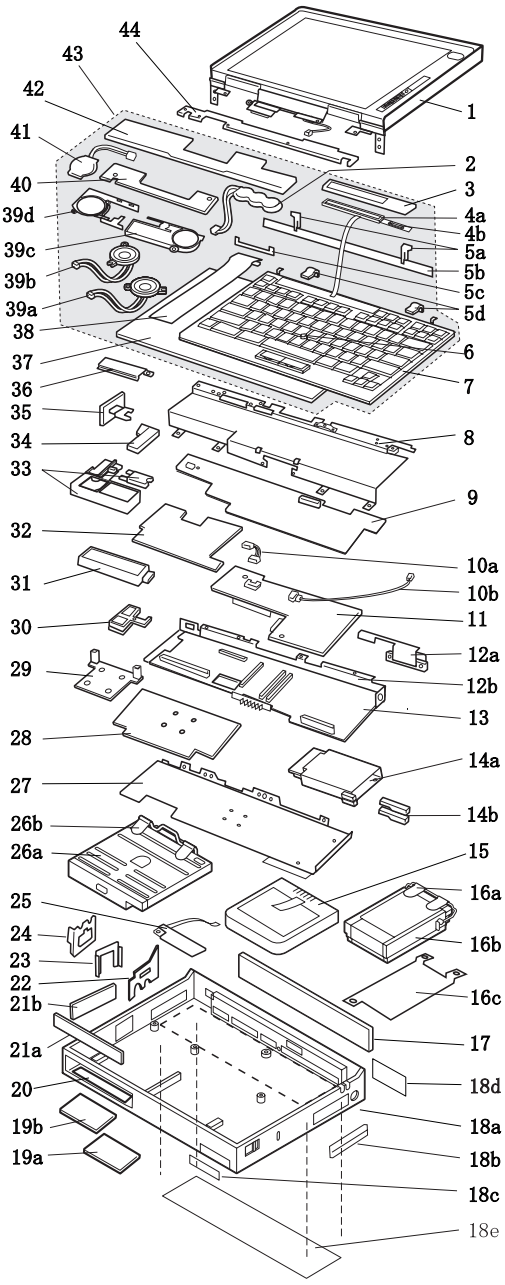
Model 760E (CD Upgradable Type) or 760ED



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Check the Model

There are two models each for 760E (CD upgradable type) and 760ED.

- The LCD thick model is the 760E/760ED with the thickness of 54.3 mm (2.14 inches).
- The LCD slim model is the 760E/760ED with the thickness of 50.7 mm (2.00 inches).

Index	*760E CD Upgradable Type or 760ED*	
1	LCD Assembly (12.1 SVGA TFT thick model) (U.S.-9546, model U3A, U3B, U3L)	29H9226
	LCD Assembly (12.1 SVGA TFT slim model)	82H8496
	LCD Assembly (12.1 XGA TFT slim model) (U.S.-9546, model U9A, U9B)	46H5735
2	Standby Battery	29H9497
3	LCD Indicator Assembly Cover	69H8403
4a	LCD Indicator Assembly	29H9220
4b	Volume Knob	69H8404
5a	See Keyboard Misc. parts	
5b	Keyboard Foot	39H7038
5c	Keyboard FPC Bracket	39H7035
5d	See Keyboard Misc. parts	
6	TrackPoint III Cap	84G6536
7	Keyboard (See Keyboard Section)	
8	Upper Shield Case	29H9213
9	Video Card (760E thick model) (U.S.-9546, model U3B)	39H6228
	Video Card (760ED thick model) (U.S.-9546, model U3A, U3L)	39H6227
	Video Card (760ED XGA slim model) (U.S.-9546, model U9A)	82H8880
	Video Card (760E XGA slim model) (U.S.-9546, model U9B)	82H8881
	Video Card (760E SVGA slim model)	12J1569
10a	Volume Connection Cable (U.S.-9546, model U3A, U3B, U3L)	29H9211
	Volume Connection Cable (760E/760ED XGA slim model) (U.S.-9546, model U9A, U9B)	82H8965
10b	Mic Connection Cable	29H9210
11	DSP Card	29H9205
12a	FDD Connector Cable	29H9203
12b	Rear Shield Case	29H9201
13	System Board (760E thick model) (U.S.-9546, model U3B)	11J8234
	System Board (760ED thick model) (U.S.-9546, model U3A, U3L)	05K3172
	System Board (760E/760ED XGA slim model) (U.S.-9546, model U9A, U9B)	05K3174
	System Board (760E/760ED SVGA slim model)	05K3172

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Index	*760E CD Upgradable Type or 760ED*	
14a	PC Card Slot	46H6031
14b	Eject Button	46H6028
15	Battery Pack (Li-ion)	29H9232
16a	HDD Removable Strap	29H9236
16b	Hard Disk Drive (810 MB)	29H9366
	Hard Disk Drive (1.08 GB)	29H9367
	Hard Disk Drive (1.2 GB)	29H9228
	(U.S.-9546, model U3A, U3B, U3L)	
	Hard Disk Drive (1.4 GB)	82H8884
	Hard Disk Drive (2.1 GB)	82H8489
	(U.S.-9546, model U9A, U9B)	
16c	EMI Sheet	39H7031
17	Rear Connector Door	29H9186
	(760E CD Upgradable Type or 760ED)	
18a	Base Cover (760E thick type)	46H6043
	For Japan	46H6044
	Base Cover (760ED)	39H6248
	For Japan	39H6233
18b	PC Card Door	29H9238
18c	Name Label	66G9228
18d	Game Port Bracket	82H8895
	(9546, model U9B only)	
18e	Thermal Rubber Sheet	69H8429
19a	DIMM Cover	69H8422
19b	DIMM Adapter Card (8 MB)	83H7126
	(U.S.-9546, model U3A, U9A, U9B)	
	DIMM Adapter Card (Blank)	83H7124
	(U.S.-9546, model U3B, U3L)	
20	Lower Spacer	29H9194
21a	FDD Blank Bezel	29H9289
	FDD Bezel	83H5431
21b	Option Cover	29H9193
22	AV Cover	29H9190
23	Modem Cover Lock	39H7027
24	Modem Cover	39H7029
	Blank Cover for EMEA	29H9188
25	Front IR Assembly	29H9215
26a	FDD Drive (3 mode)	29H9230
	(U.S.-9546, model U3A, U3B, U3L, U9A, U9B)	
	FDD Drive for Japan (4 mode)	29H9372
	In the U.S., either of the CD-ROM 4X drives below may be used for 9546, model U3A, U3B, U3L)	
	Order the FRU number of the drive being replaced.	
	CD-ROM Drive (4X)	29H9231
	CD-ROM Drive (4X)	12J2186
	CD-ROM CD-ROM Drive (6X)	
	slim model	83H5428
	(U.S.-9546, model U9A)	
26b	Diskette Drive Removable Strap	29H9237
27	Lower Shield	29H9202
28	CPU Card	
	(120 MHz, Pentium) thick model	11J9672
	(U.S.-9546, model U3B, U3L)	
	CPU Card	
	(133 MHz, Pentium)	82H8897
	(U.S.-9546, model U3A, U9A)	
	CPU Card	
	(150 MHz, Pentium) slim model	82H8877
	(U.S.-9546, model U9B)	

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Index	*760E CD Upgradable Type or 760ED*	
29	Heat Sink	39H7006
30	See Misc. Parts	
31	Internal DAA Assembly	12J1571
32	DC/DC Card	83H5375
	(U.S.-9546, model U3A, U3B, U3L, U9A)	
	DC/DC Card	
	for CPU Card 150 MHz, Pentium	83H5378
	(U.S.-9546, model U9B)	
33	See Misc. Parts	
34	Power Switch Actuator	29H9209
35	Power Switch Button	29H9192
36	Rear IR Assembly	29H9214
37	Keyboard Base	29H9218
38	Keyboard Cable	29H9222
39a	Speaker (right)	29H9225
39b	Speaker (left)	39H6983
39c	Speaker Holder (right)	39H7033
39d	Speaker Holder (left)	39H7034
40	Keyboard Card	29H9221
41	Backup Battery	29H9506
42	Palm Rest	29H9219
	For Japan	39H7032
43	Keyboard Unit (See Keyboard Unit Section)	
44	Top Cover	29H9184
	AC Adapter (35W, U.S./Canada/	
	Latin America/Japan)	85G6705
	For EMEA/AP	12J1448
	For EMEA/AP Slim 3-Prong	85G6735
	Keyboard Misc. Parts	39H7105
	Misc. Parts (760E thick type)	46H5367
	(Includes the following:)	
	Modem Holder	
	Modem Lever	
	Rear IR Lens	
	S-Video Bracket	
	Video Bracket	
	Misc. Parts (760ED)	29H9235
	(Includes the following:)	
	Modem Holder	
	Modem Lever	
	DSP Holder	
	Rear IR Lens	
	S-Video Bracket	

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Keyboard Assembly

Arabic	29H9076
Belgian	29H9074
Canadian French	29H9082
Danish	29H9073
Dutch	29H9071
French	29H9067
German	29H9065
Greek	29H9080
Hebrew	29H9077
Italian	29H9069
Japanese	29H9083
New World Spanish	29H9081
Norwegian	29H9075
Portuguese	29H9078
Russian	29H9084
Spanish	29H9072
Swedish or Finnish	29H9070
Swiss	46H5989
Turkish	29H9079
U.K. English	29H9064
U.S. English	29H9063

Keyboard Unit

Arabic	29H9408
Belgian	29H9406
Canadian French	29H9414
Danish	29H9405
Dutch	29H9403
French	29H9399
German	29H9397
Greek	29H9412
Hebrew	29H9409
Italian	29H9401
Japanese	29H9415
New World Spanish	29H9413
Norwegian	29H9407
Portuguese	29H9410
Russian	29H9416
Spanish	29H9404
Swedish or Finnish	29H9402
Swiss	46H5990
Turkish	29H9411
U.K. English	29H9396
U.S. English	29H9395

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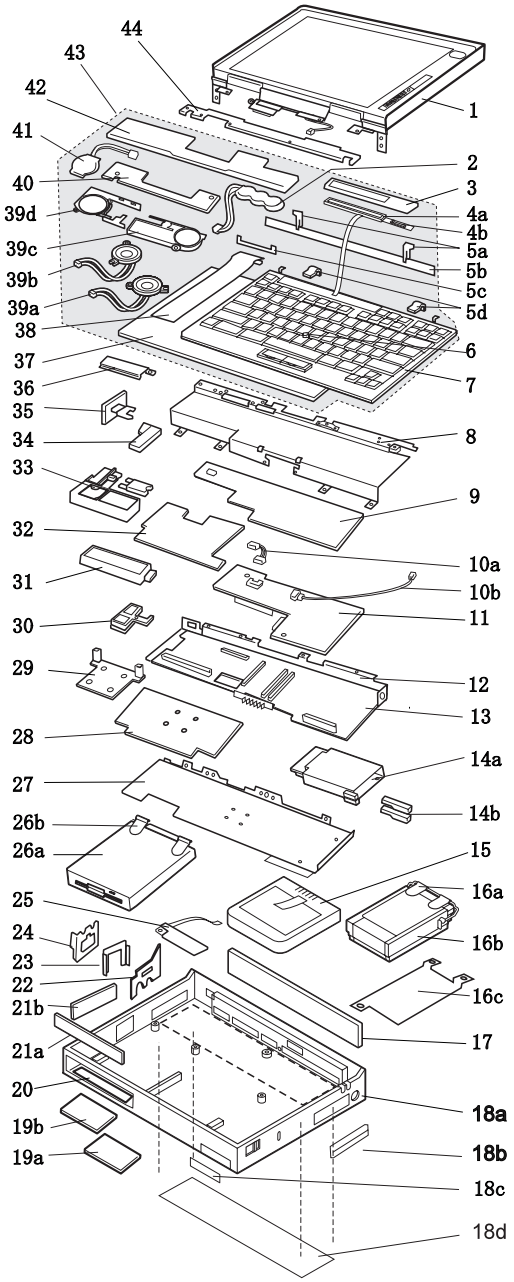
Model 760L



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Index	*Part (760L)*	
1	LCD Assembly (10.4 TFT)	46H5355
2	Standby Battery	29H9497
3	LCD Indicator Assembly Cover	69H8403
4a	LCD Indicator Assembly	29H9220
4b	Volume Knob	69H8404
5a	See Keyboard Misc. parts	
5b	Keyboard Foot	39H7038
5c	Keyboard FPC Bracket	39H7035
5d	See Keyboard Misc. parts	
6	TrackPoint III Cap	84G6536
7	Keyboard (See Keyboard Section)	
8	Upper Shield Case	29H9212
9	Video Card	29H9207
10a	Volume Connection Cable	29H9211
10b	Mic Connection Cable	29H9210
11	ESS Card	46H5353
12	Rear Shield Case	29H9200
13	System Board	29H9199
14a	PC Card Slot	39H7019
14b	Eject Button	39H7018
15	Battery Pack (Ni-MH)	29H9233
16a	HDD Removable Strap	29H9236
16b	Hard Disk Drive (810 MB, 12.7 mm)	29H9366
16c	EMI Sheet	39H7031
17	Rear Connector Door	29H9185
18a	Base Cover	46H5358
18b	PC Card Door	29H9238
18c	Name Label	66G9228
18d	Thermal Rubber Sheet	82H8966
19a	DIMM Cover	69H8422
19b	DIMM Adapter Card	29H9296
20	Lower Spacer	29H9194
21a	FDD Blank Bezel	29H9239
	FDD Bezel	29H9196
21b	Option Cover	29H9193
22	AV Cover	29H9189
23	Modem Cover Lock	39H7028
24	Modem Cover	39H7030
	Blank Cover for EMEA	29H9187
25	Front IR Assembly	29H9215
26a	Diskette Drive (3-mode)	29H9230
26b	Diskette Drive Removable Strap	29H9237
27	Lower Shield	29H9202

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Index	*Part (760L)*	
28	CPU Card (90 MHz, Pentium)	29H9198
	(U.S.-9547, model U01, U0A, U0R)	
	CPU Card (120 MHz, Pentium)	29H9297
29	Heat Sink (Pentium 90MHz)	39H7005
	(U.S.-9547, model U01, U0A, U0R)	
	Heat Sink (Pentium 120MHz)	39H7006
30	See Misc. Parts	
31	Modem Bracket Assembly	46H5360
32	DC/DC Card	83H5375
33	See Misc. Parts	
34	Power Switch Actuator	29H9209
35	Power Switch Button	29H9191
36	Rear IR Assembly	29H9214
37	Keyboard Base	29H9218
38	Keyboard Cable	29H9222
39a	Speaker (right)	29H9225
39b	Speaker (left)	39H6983
39c	Speaker Holder (right)	39H7033
39d	Speaker Holder (left)	39H7034
40	Keyboard Card	29H9221
41	Backup Battery	29H9506
42	Palm Rest	29H9219
43	Keyboard Unit (See Keyboard Unit Section)	
44	Top Cover	29H9183
	AC Adapter (35W)	85G6701
	For Japan	85G6699
	Keyboard Misc. Parts	39H7039
	Misc. Parts	46H5366
	(Includes the following:)	
	Modem Holder	
	Modem Lever	
	Rear IR Lens	

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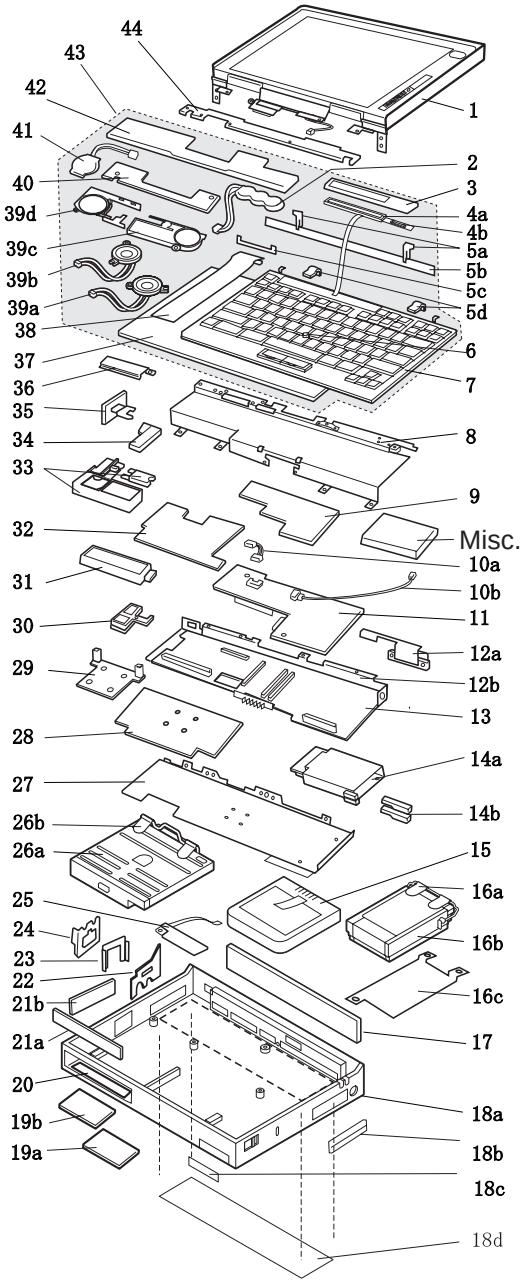
Model 760LD



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Index	*Part (760LD)*	
1	LCD Assembly (10.4 TFT)	46H5355
2	Standby Battery	29H9497
3	LCD Indicator Assembly Cover	69H8403
4a	LCD Indicator Assembly	29H9220
4b	Volume Knob	69H8404
5a	See Keyboard Misc. Parts	
5b	Keyboard Foot	39H7038
5c	Keyboard FPC Bracket	39H7035
5d	See Keyboard Misc. Parts	
6	TrackPoint III Cap	84G6536
7	Keyboard (See Keyboard Section)	
8	Upper Shield Case	29H9213
9	Video Card	46H5318
10a	Volume Connection Cable	29H9211
10b	Mic Connection Cable	29H9210
11	ESS Card	46H5353
12a	External Diskette Drive Connector	29H9203
12b	Rear Shield Case	29H9201
13	System Board	29H9199
14a	PC Card Slot	39H7019
14b	Eject Button	39H7018
15	Battery Pack (Ni-MH)	29H9233
16a	HDD Removable Strap	29H9236
16b	Hard Disk Drive (810 MB, 12.7 mm)	29H9366
16c	EMI Sheet	39H7031
17	Rear Connector Door	29H9186
18a	Base Cover	46H5359
18b	PC Card Door	29H9238
18c	Name Label	66G9228
18d	Thermal Rubber Sheet	69H8429
19a	DIMM Cover	69H8422
19b	DIMM Adapter Card	29H9296
20	Lower Spacer	29H9194
21a	CD-ROM Blank Bezel	29H9289
	Diskette Drive Bezel	29H9197
21b	Option Cover	29H9193
22	AV Cover	29H9190
23	Modem Cover Lock	39H7027
24	Modem Cover	39H7029
	Blank Cover for EMEA	29H9188
25	Front IR Assembly	29H9215
26	CD-ROM Drive	39H7424
27	Lower Shield	29H9202

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Index	*Part (760LD)*	
28	CPU Card (90 MHz, Pentium)	29H9198
	(U.S.-9547, model U31, U3A, U3R)	
	CPU Card (120 MHz, Pentium)	29H9297
29	Heat Sink (Pentium 90MHz)	39H7005
	(U.S.-9547, model U31, U3A, U3R)	
	Heat Sink (Pentium 120MHz)	39H7006
30	See Misc. Parts	
31	Modem Bracket Assembly	46H5360
32	DC/DC Card	83H5375
33	See Misc. Parts	
34	Power Switch Actuator	29H9209
35	Power Switch Button	29H9192
36	Rear IR Assembly	29H9214
37	Keyboard Base	29H9218
38	Keyboard Cable	29H9222
39a	Speaker (right)	29H9225
39b	Speaker (left)	39H6983
39c	Speaker Holder (right)	39H7033
39d	Speaker Holder (left)	39H7034
40	Keyboard Card	29H9221
41	Backup Battery	29H9506
42	Palm Rest	29H9219
	For Japan	29H7032
43	Keyboard Unit (See Keyboard Unit Section)	
44	Top Cover	29H9184

	Diskette Drive (3-mode)	29H9230
	Diskette Drive (4-mode, Japan)	29H9372
	Diskette Drive Removable Strap	29H9237
	Wall Plug	85G2367
	Microphone	66G7871
	AC Adapter (35W)	85G6701
	For Japan	85G6699
	Keyboard Misc. Parts	39H7039
	Misc. Parts	46H5367
	(Includes the following:)	
	Modem Holder	
	Modem Lever	
	Rear IR Lens	

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Keyboard Assembly

Arabic	29H9076
Belgian	29H9074
Canadian French	29H9082
Czech	29H9292
Danish	29H9073
Dutch	29H9071
French	29H9067
German	29H9065
Greek	29H9080
Hebrew	29H9077
Hungary	29H9291
Italian	29H9069
Japanese	29H9083
New World Spanish	29H9081
Norwegian	29H9075
Portuguese	29H9078
Polish	29H9290
Russian	29H9084
Slovak	29H9293
Spanish	29H9072
Swedish or Finnish	29H9070
Swiss	46H5989
Turkish	29H9079
U.K. English	29H9064
U.S. English	29H9063

Keyboard Unit

Arabic	29H9408
Belgian	29H9406
Canadian French	29H9414
Czech	39H6978
Danish	29H9405
Dutch	29H9403
French	29H9399
German	29H9397
Greek	29H9412
Hebrew	29H9409
Hungary	39H6977
Italian	29H9401
Japanese	29H9415
New World Spanish	29H9413
Norwegian	29H9407
Portuguese	29H9410
Polish	39H6976
Russian	29H9416
Slovak	39H6979
Spanish	29H9404
Swedish or Finnish	29H9402
Swiss	46H5990
Turkish	29H9411
U.K. English	29H9396
U.S. English	29H9395

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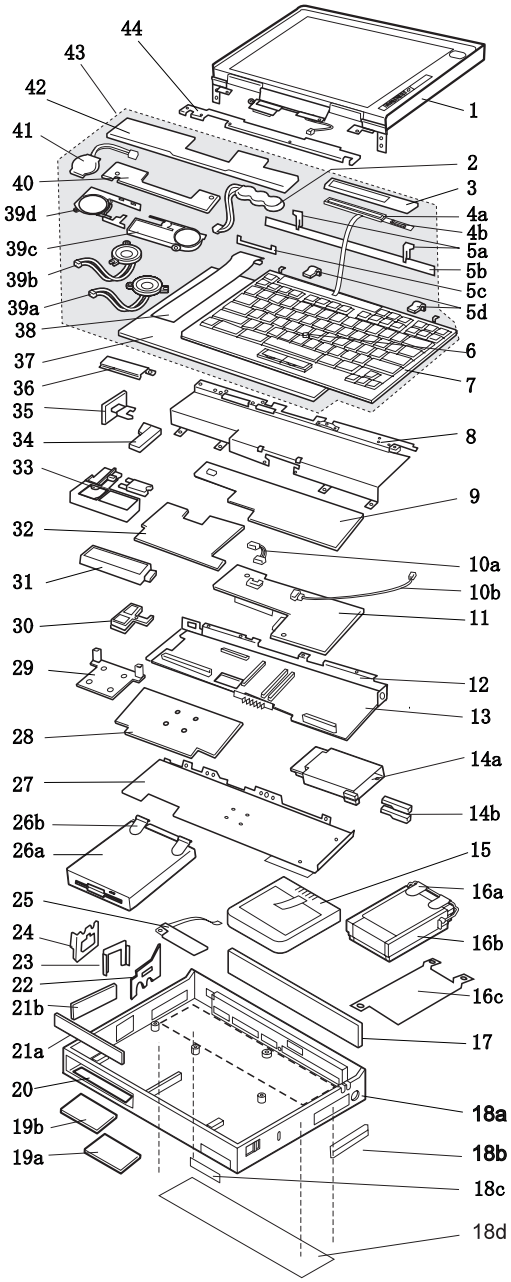
Model 760EL or 760ELD



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Index	*Part (760EL/760ELD)*	
1	LCD Assembly (760EL/760ELD, 12.1 TFT thick type) (U.S.-9547, model U3F, U48, U4F, U4H, U4R, U4S)	29H9226
	LCD Assembly (760EL, 11.3, DSTN) (U.S.-9547, model U6F, U6G, U6H, U6R)	39H6232
	LCD Assembly (760EL, 12.1 TFT slim type) (U.S.-9547, model U4G, U4K, U4T)	82H8496
2	Standby Battery	29H9497
3	LCD Indicator Assembly Cover	69H8303
4a	LCD Indicator Assembly	29H9220
4b	Volume Knob	69H8304
5a	See Keyboard Misc. parts	
5b	Keyboard Foot	39H7038
5c	Keyboard FPC Bracket	39H7035
5d	See Keyboard Misc. parts	
6	TrackPoint III Cap	84G6536
7	Keyboard (See Keyboard Section)	
8	Upper Shield Case	29H9213
9	Video Card (U.S.-9547, model U3F, U48, U4F, U4H, U4R, U4S, U6F, U6G, U6H, U6R)	39H6228
	Video Card (U.S.-9547, model U4G, U4K, U4T)	97H5502
10a	Volume Connection Cable	29H9211
10b	Mic Connection Cable	29H9210
11	ESS Card	46H5353
12a	Rear Shield Case	29H9201
12b	FDD Connector Cable	29H9203
13	System Board (U.S.-9547, model U3F, U48, U4F) U4H, U4R, U4S, U6F, U6G, U6R)	11J8234
	System Board- SVGA (U.S.-9547, model U4G, U4K, U4T)	11J7660
	System Board- DSTN (U.S.-9547, model U6H)	11J8234

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Index	*Part (760EL/760ELD)*	
14a	PC Card Slot	46H6031
14b	Eject Button	46H6028
15	Battery Pack (Li-ion)	29H9232
16a	HDD Removable Strap	29H9236
16b	Hard Disk Drive (810 MB) (U.S.-9547, model U3F, U6F, U6G, U6R)	29H9366
	Hard Disk Drive (1.08 GB) (U.S.-9547, model U48, U4F, U4H, U4R, U4S)	29H9367
	Hard Disk Drive (1.2 GB)	29H9228
	Hard Disk Drive (1.4 GB) (U.S.-9547, model U6H)	82H8884
	Hard Disk Drive (2.1 GB) (U.S.-9547, model U4G, U4K, U4T)	82H8489
16c	EMI Sheet	39H7031
17	Rear Connector Door	29H9186
18a	Base Cover	46H5599
	For Japan	46H5600
18b	PC Card Door	29H9238
18c	Name Label	46H6034
18d	Game Port Bracket (U.S.-9547, model U4G, U4K, U4T)	82H8895
18e	Thermal Rubber Sheet	82H8966
19a	DIMM Cover	69H8422
19b	DIMM Adapter Card (8 MB) (U.S.-9547, model U48, U4G, U4H, U4K, U4R, U4T)	83H7126
19b	DIMM Adapter Card (Blank) (U.S.-9547, model U3F, U4F, U4S, U6F, U6G, U6H, U6R)	83H7124
20	Lower Spacer	29H9194
21a	FDD Blank Bezel	29H9289
	FDD Bezel	83H5431
21b	Option Cover	29H9193
22	AV Cover	29H9190
23	Modem Cover Lock	39H7027
24	Modem Cover	29H9188
25	Front IR Assembly	29H9215
26a	Diskette Drive (3-mode) (U.S.-9547, model U3F, U48, U4F, U4G, U4K, U4S, U4T, U6F, U6G, U6H, U6R)	29H9230
	Diskette Drive (4-mode)	29H9372
	Note: In the U.S., either of the CD-ROM 4X drives below may be used for 9547, model U3F. Order the FRU number of the drive being replaced.	
	CD-ROM Drive, 4X	29H9231
	CD-ROM Drive, 4X	02K0490
26b	Diskette Drive Removable Strap	29H9237
27	Lower Shield	29H9202

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Index	*Part (760EL/760ELD)*	
28	CPU Card	
	(760EL/760ELD, 100 MHz, Pentium)	11J9673
	(U.S.-9547, model U3F, U6G)	
	CPU Card	
	(760EL/760ELD, 120 MHz, Pentium)	12J1574
	(U.S.-9547, model U4F, U4S, U6F, U6R)	
	CPU Card (760EL, 133 MHz, Pentium)	11J9674
	(U.S.-9547, model U48, U4H, U4R)	
	CPU Card (760EL, 133 MHz, Pentium)	82H8897
	(U.S.-9547, model U4G, U4K, U4T)	
	CPU Card (760EL, 120 MHz, Pentium)	12J1574
	(U.S.-9547, model U6H)	
29	Heat Sink	39H7006
30	See Misc. Parts	
31	Modem Bracket Assembly	46H5360
32	DC/DC Card	29H9204
33	See Misc. Parts	
34	Power Switch Actuator	29H9209
35	Power Switch Button	29H9192
36	Rear IR Assembly	29H9214
37	Keyboard Base	29H9218
38	Keyboard Cable	29H9222
39a	Speaker (right)	29H9225
39b	Speaker (left)	39H6983
39c	Speaker Holder (right)	39H7033
39d	Speaker Holder (left)	39H7034
40	Keyboard Card	29H9221
41	Backup Battery	29H9506
42	Palm Rest	29H9219
	For Japan	39H7032
43	Keyboard Unit (See Keyboard Unit Section)	
44	Top Cover	29H9184
	AC Adapter (35W, Slim U.S., Japan)	85G6705
	For EMEA/AP	85G6701
	For EMEA/AP Slim 3-Prong	85G6735
	Keyboard Misc. Parts	39H7105
	Misc. Parts	29H9234
	(Includes the following:)	
	Modem Holder	
	Modem Lever	
	DSP Holder	
	Rear IR Lens	

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Keyboard Assembly

Arabic	29H9076
Belgian	29H9074
Canadian French	29H9082
Danish	29H9073
Dutch	29H9071
French	29H9067
German	29H9065
Greek	29H9080
Hebrew	29H9077
Italian	29H9069
Japanese	29H9083
New World Spanish	29H9081
Norwegian	29H9075
Portuguese	29H9078
Russian	29H9084
Slovak	29H9293
Spanish	29H9072
Swedish or Finnish	29H9070
Swiss	46H5989
Turkish	29H9079
U.K. English	29H9064
U.S. English	29H9063

Keyboard Unit

Arabic	29H9408
Belgian	29H9406
Canadian French	29H9414
Danish	29H9405
Dutch	29H9403
French	29H9399
German	29H9397
Greek	29H9412
Hebrew	29H9409
Italian	29H9401
Japanese	29H9415
New World Spanish	29H9413
Norwegian	29H9407
Portuguese	29H9410
Russian	29H9416
Slovak	39H6979
Spanish	29H9404
Swedish or Finnish	29H9402
Swiss	46H5990
Turkish	29H9411
U.K. English	29H9396
U.S. English	29H9395

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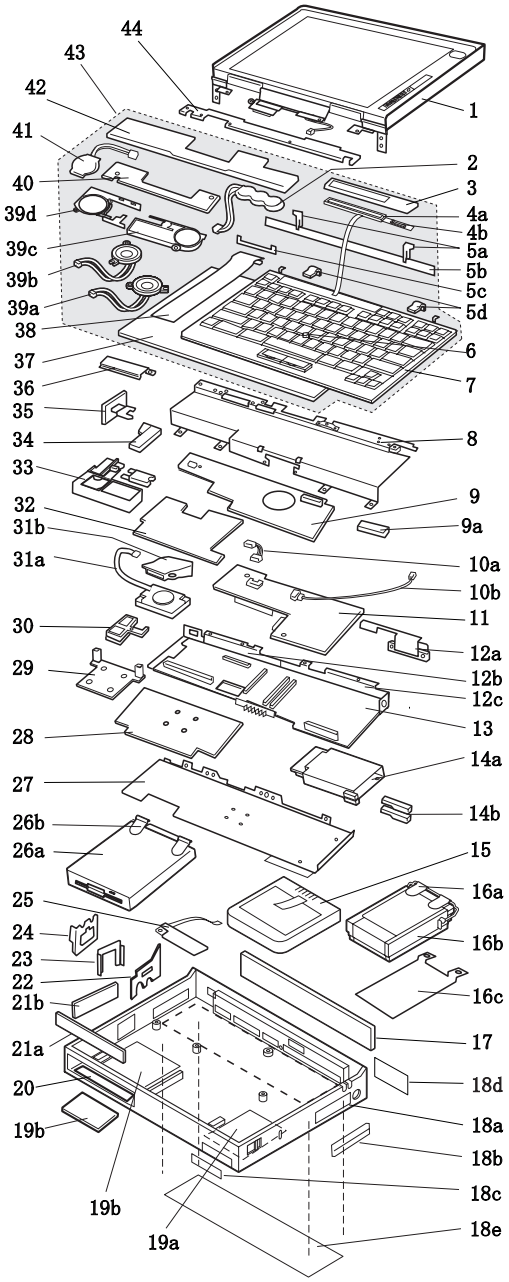
Model 760XL



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Index	*Part (760XL)*	
1	LCD Assembly (12.1, TFT)	46H5725
2	Standby Battery	29H9497
3	LCD Indicator Assembly Cover	69H8403
4a	LCD Indicator Assembly	46H5889
4b	Volume Knob	69H8404
5a	See Keyboard Misc. parts	
5b	Keyboard Foot	39H7038
5c	Keyboard FPC Bracket	39H7035
5d	See Keyboard Misc. parts	
6	TrackPoint III Cap	84G6536
7	Keyboard (See Keyboard Section)	
8	Upper Shield Case	29H9213
9	Video Card	46H5771
9a	Acoustic Spacer	46H5495
10a	Volume Connection Cable	29H9211
10b	Mic Connection Cable	29H9210
11	ESS Card	46H5775
12a	External FDD Connector	29H9203
12b	Rear Shield Case (left)	46H5759
12c	Rear Shield Case (right)	46H5758
13	System Board (SVGA)	46H5773
14a	PC Card Slot	46H5751
14b	Eject Button	46H6028
15	Battery Pack (Li-ion)	29H9232
16a	HDD Removable Strap	29H9236
16b	Hard Disk Drive (2.1 GB)	82H8489
	(U.S.-9547, model U9C, U9K)	
	Hard Disk Drive (5.1 GB)	00K7907
16c	EMI Sheet	46H5497
17	Rear Connector Door	46H5764
18a	Base Cover	46H5756
	For Japan	46H5757
18b	PC Card Door	29H9238
18c	Name Label	66G9228
18d	Game Port Bracket	82H8895
18e	Thermal Rubber Sheet	82H8966
19a	Shield Plate, right	46H5760
19b	Shield Plate, left	46H5761
19c	DIMM Adapter Card (8 MB)	46H5768
20	Lower Spacer	29H9194
21a	FDD Blank Bezel	29H9289
	FDD Bezel	29H9197
21b	Option Cover	29H9193

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Index	*Part (760XL)*	
22	AV Cover	29H9190
23	Modem Cover Lock	39H7027
24	Blank Cover for EMEA	29H9188
25	Front IR Assembly	29H9215
26a	Diskette Drive (3-mode)	29H9230
	(U.S.-9547, model U9C, U9K)	
	Diskette Drive (4-mode, for Japan)	29H9372
26b	Diskette Drive Removable Strap	29H9237
27	Lower Shield	29H9202
28	CPU Card (166 MHz, Pentium)	82H8875
29	Heat Sink	39H7006
30	See Misc. Parts	
31a	Fan	46H5762
31b	Air Duct	46H5763
32	DC/DC Card	46H5750
33	See Misc. Parts	
34	Power Switch Actuator	29H9209
35	Power Switch Button	29H9192
36	Rear IR Assembly	29H9214
37	Keyboard Base	29H9218
38	Keyboard Cable	29H9222
39a	Speaker (right)	46H5777
39b	Speaker (left)	46H5778
39c	Speaker Holder (right)	39H7033
39d	Speaker Holder (left)	39H7034
40	Keyboard Card	46H5776
41	Backup Battery	29H9506
42	Palm Rest	29H9219
	For Japan	39H7032
43	Keyboard Unit (See Keyboard Unit Section)	
44	Top Cover	29H9184
	DIMM Card Holder	46H5765
	AC Adapter (35W)	
	For U.S/Canada/LA/Japan	85G6705
	For EMEA/AP	85G6735
	Keyboard Misc. Parts	39H7105
	Misc. Parts	46H5367
	(Includes the following:)	
	Modem Holder	
	Modem Lever	
	DSP Holder	
	Rear IR Lens	
	Screw for Fan	46H5766
	Name Label	46H5767

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Keyboard Assembly

Arabic	29H9076
Belgian	29H9074
Canadian French	29H9082
Danish	29H9073
Dutch	29H9071
French	29H9067
German	29H9065
Greek	29H9080
Hebrew	29H9077
Italian	29H9069
Japanese	29H9083
New World Spanish	29H9081
Norwegian	29H9075
Portuguese	29H9078
Russian	29H9084
Spanish	29H9072
Swedish or Finnish	29H9070
Swiss	46H5989
Turkish	29H9079
U.K. English	29H9064
U.S. English	29H9063

Keyboard Unit

Arabic	46H5790
Belgian	46H5788
Canadian French	46H5796
Danish	46H5787
Dutch	46H5785
French	46H5782
German	46H5781
Greek	46H5794
Hebrew	46H5791
Italian	46H5783
Japanese	46H5797
Latain Spanish	46H5795
New World Spanish	
Norwegian	46H5789
Portuguese	46H5792
Russian	46H5798
Spanish	46H5786
Swedish or Finnish	46H5784
Swiss	46H5799
Turkish	46H5793
U.K. English	46H5780
U.S. English	46H5779

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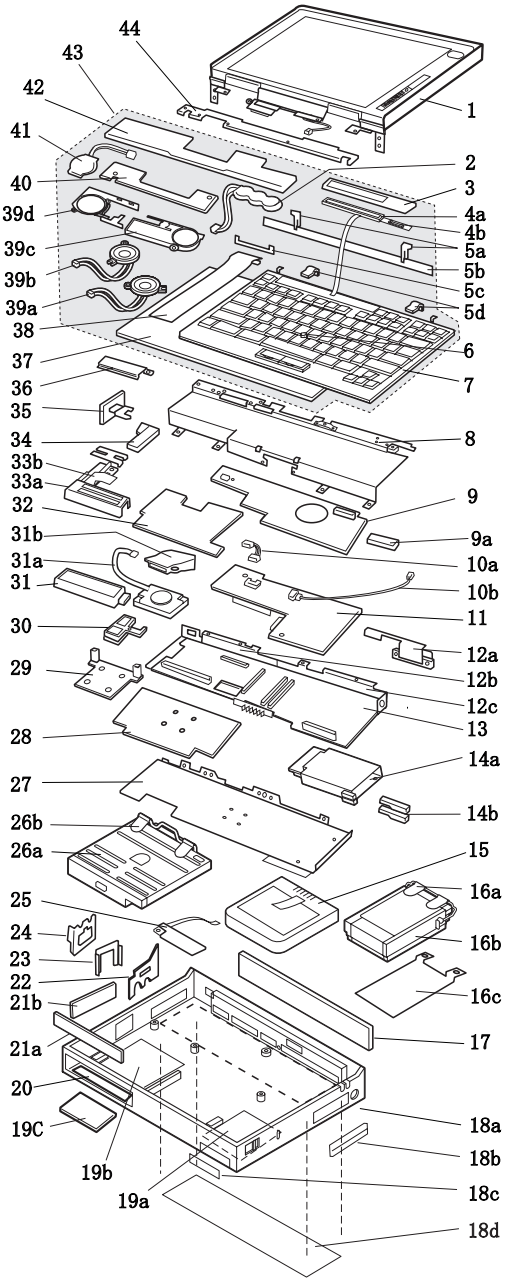
Model 760XD



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Index	*Part (760XD)*	
1	LCD Assembly	
	(12.1, XGA, TFT)	46H5735
2	Standby Battery	29H9497
3	LCD Indicator Assembly Cover	46H5736
4a	LCD Indicator Assembly	46H5889
4b	Volume Knob	69H8404
5a	See Keyboard Misc. parts	
5b	Keyboard Foot	39H7038
5c	Keyboard FPC Bracket	39H7035
5d	See Keyboard Misc. parts	
6	TrackPoint III Cap	84G6536
7	Keyboard (See Keyboard Section)	
8	Upper Shield Case	29H9213
9	Video Card	46H5770
9a	Acoustic Spacer	46H5495
10a	Volume Connection Cable	82H8965
10b	Mic Connection Cable	29H9210
11	DSP Card	29H9205
12a	FDD Connector Cable	29H9203
12b	Rear Shield Case (left)	46H5759
12c	Rear Shield Case (right)	46H5758
13	System Board (XGA)	46H5772
14a	PC Card Slot	46H5751
14b	Eject Button	46H6028
15	Battery Pack (Li-ion)	29H9232
16a	HDD Removable Strap	29H9236
16b	Hard Disk Drive (3 GB)	45H8791
	(U.S.-9546, model U9E)	
	Hard Disk Drive (5.1 GB)	00K7907
16c	EMI Sheet	46H5497
17	Rear Connector Door	46H5764
18a	Base Cover	46H5754
	For Japan	46H5755
18b	PC Card Door	29H9238
18c	Name Label	66G9228
18d	Thermal Rubber Sheet	82H8966
19a	Shield Plate, right	46H5760
19b	Shield Plate, left	46H5761
19c	DIMM Adapter Card (8 MB)	46H5768
20	Lower Spacer	29H9194

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Index	*Part (760XD)*	
21a	FDD Blank Bezel	29H9289
	FDD Bezel	29H9197
21b	Option Cover	29H9193
22	AV Cover	29H9190
23	Modem Cover Lock	39H7027
24	Modem Cover	39H7029
25	Front IR Assembly	29H9215
26a	Diskette Drive (3-mode)	29H9230
	(U.S.-9546, model U9E)	
	Diskette Drive (4-mode)	29H9372
	CD-ROM Drive (8x)	82H8851
	(U.S.-9546, model U9E)	
26b	Diskette Drive Removable Strap	29H9237
27	Lower Shield	29H9202
28	CPU Card (166 MHz, Pentium)	82H8875
29	Heat Sink	39H7006
30	See Misc. Parts	
31	Internal DAA Assembly	12J1571
31a	Fan	46H5762
31b	Air Duct	46H5763
32	DC/DC Card	46H5750
33a	See Misc. Parts	
33b	Cable	29H9206
34	Power Switch Actuator	29H9209
35	Power Switch Button	29H9192
36	Rear IR Assembly	29H9214
37	Keyboard Base	29H9218
38	Keyboard Cable	29H9222
39a	Speaker (right)	46H5777
39b	Speaker (left)	46H5778
39c	Speaker Holder (right)	39H7033
39d	Speaker Holder (left)	39H7034
40	Keyboard Card	46H5776
41	Backup Battery	29H9506
42	Palm Rest	29H9219
	For Japan	39H7032
43	Keyboard Unit (See Keyboard Unit Section)	
44	Top Cover	29H9184
	DIMM Card Holder	46H5765
	AC Adapter (35W, Slim U.S., Japan)	85G6705
	For EMEA/AP	85G6701
	For EMEA/AP Slim 3-Prong	85G6735
	Keyboard Misc. Parts	39H7105
	Misc. Parts	29H9235
	(Includes the following:)	
	Modem Holder	
	Modem Lever	
	DSP Holder	
	Rear IR Lens	
	Screw for Fan	46H5766
	Model Label	46H5767

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Keyboard Assembly

Arabic	29H9076
Belgian	29H9074
Canadian French	29H9082
Danish	29H9073
Dutch	29H9071
French	29H9067
German	29H9065
Greek	29H9080
Hebrew	29H9077
Italian	29H9069
Japanese	29H9083
New World Spanish	29H9081
Norwegian	29H9075
Portuguese	29H9078
Russian	29H9084
Spanish	29H9072
Swedish or Finnish	29H9070
Swiss	46H5989
Turkish	29H9079
U.K. English	29H9064
U.S. English	29H9063

Keyboard Unit

Arabic	46H5790
Belgian	46H5788
Canadian French	46H5796
Danish	46H5787
Dutch	46H5785
French	46H5782
German	46H5781
Greek	46H5794
Hebrew	46H5791
Italian	46H5783
Japanese	46H5797
Latain Spanish	46H5795
New World Spanish	
Norwegian	46H5789
Portuguese	46H5792
Russian	46H5798
Spanish	46H5786
Swedish or Finnish	46H5784
Swiss	46H5799
Turkish	46H5793
U.K. English	46H5780
U.S. English	46H5779

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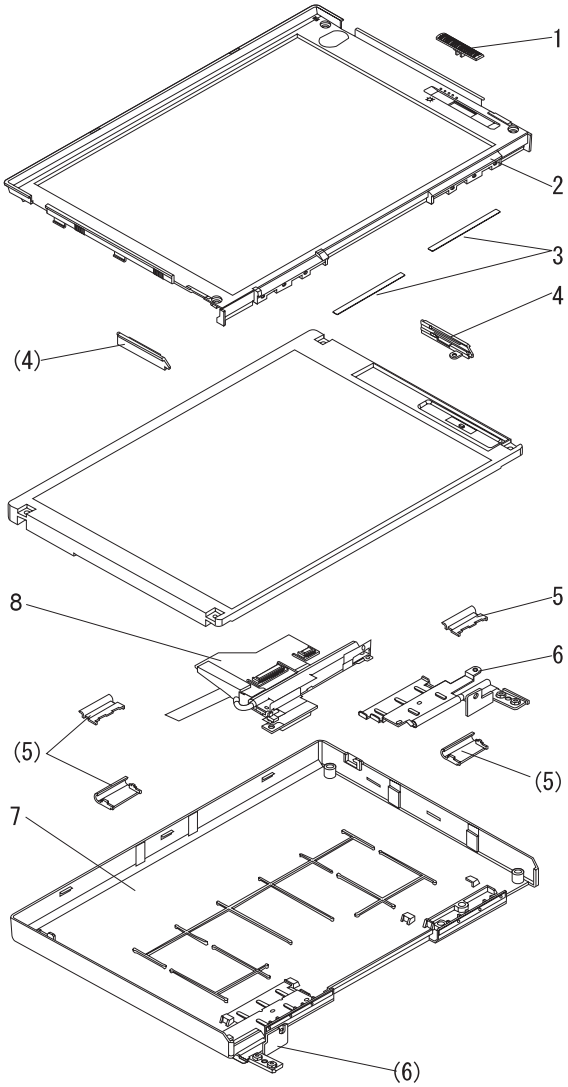
LCD Parts List

LCD Unit, 12.1 SVGA (P/N 29H9226, ASM P/N 29H9029)



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LCD Cover Group	46H5710
Note Includes the following parts: **1** Slide Knob **2** Front Cover **3** Screw Cap, Large **4** Guide (R/L) **5** Hinge Cover (R/L) **7** Rear Cover **-** Screw Cap **-** Screw **-** Tape	
Hinge Group	46H5714
Note Includes the following parts: **6** Hinge (R/L) **-** Screw Cap	
Interface Cable Group	46H5717
Note Includes the following parts: **8** Interface Cable Assembly **-** Screw Cap	

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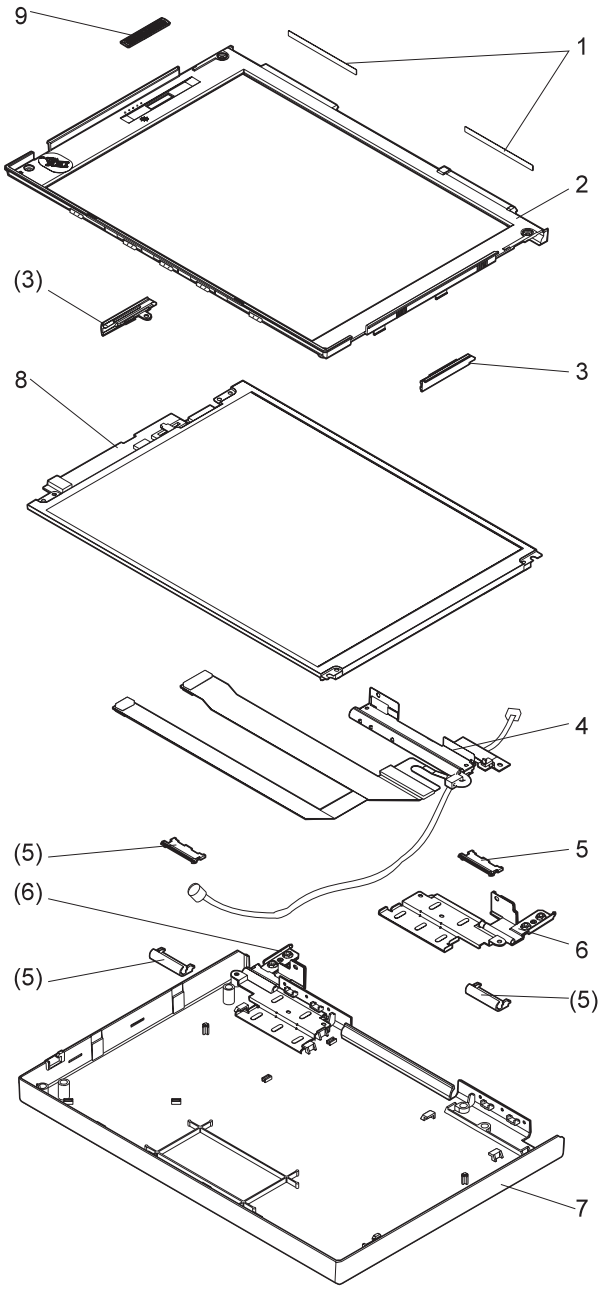
LCD Unit, 12.1 SVGA (P/N 29H9226, ASM P/N 73H6599)



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LCD Cover Group 46H5711

Note

Includes the following parts:

1 Screw Cap, Large
2 Front Cover
3 Guide (R/L)
5 Hinge Cover (R/L)
7 Rear Cover
8 Slide Knob
- Screw Cap
- Screw
- Tape

Hinge Group 46H5714

Note

Includes the following parts:

6 Hinge (R/L)
- Screw Cap

Interface Cable Group 46H5718

Note

Includes the following parts:

4 Interface Cable Assembly
- Screw Cap

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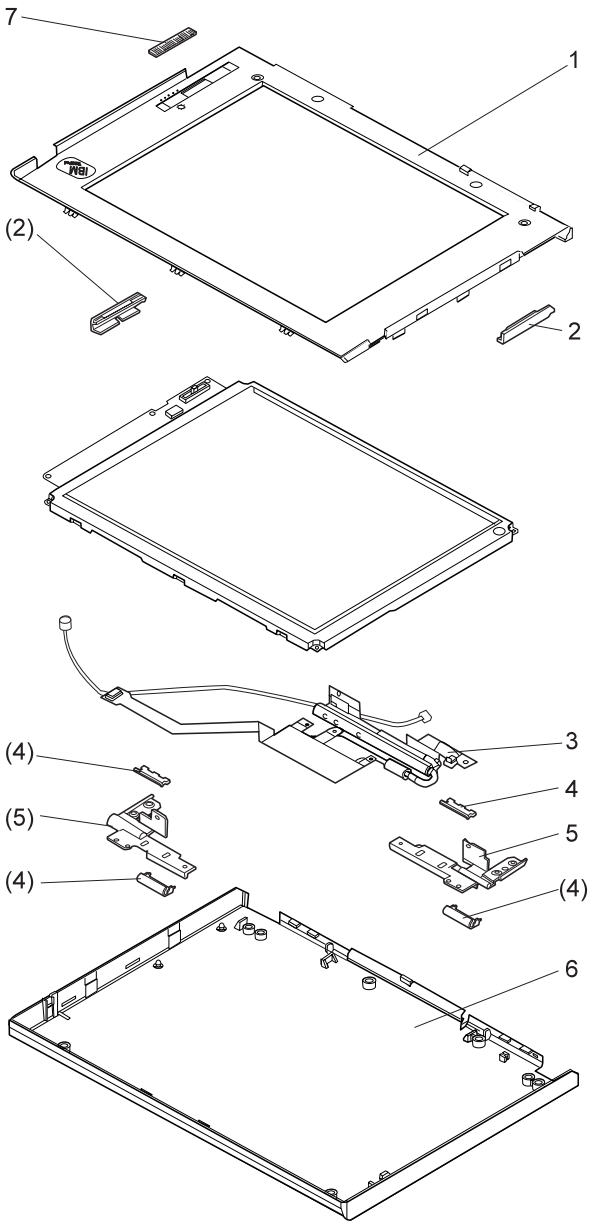
LCD Unit, 10.4 SVGA (P/N 29H9227)



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LCD Cover Group 46H5712

Note

Includes the following parts:

1 Front Cover
2 Guide (R/L)
4 Hinge Cover (R/L)
6 Rear Cover
7 Slide Knob
- Screw Cap
- Screw
- Tape

Hinge Group 46H5715

Note

Includes the following parts:

5 Hinge (R/L)
- Screw Cap

Interface Cable Assembly 46H5719

Note

Includes the following parts:

3 Interface Cable Assembly
- Screw Cap

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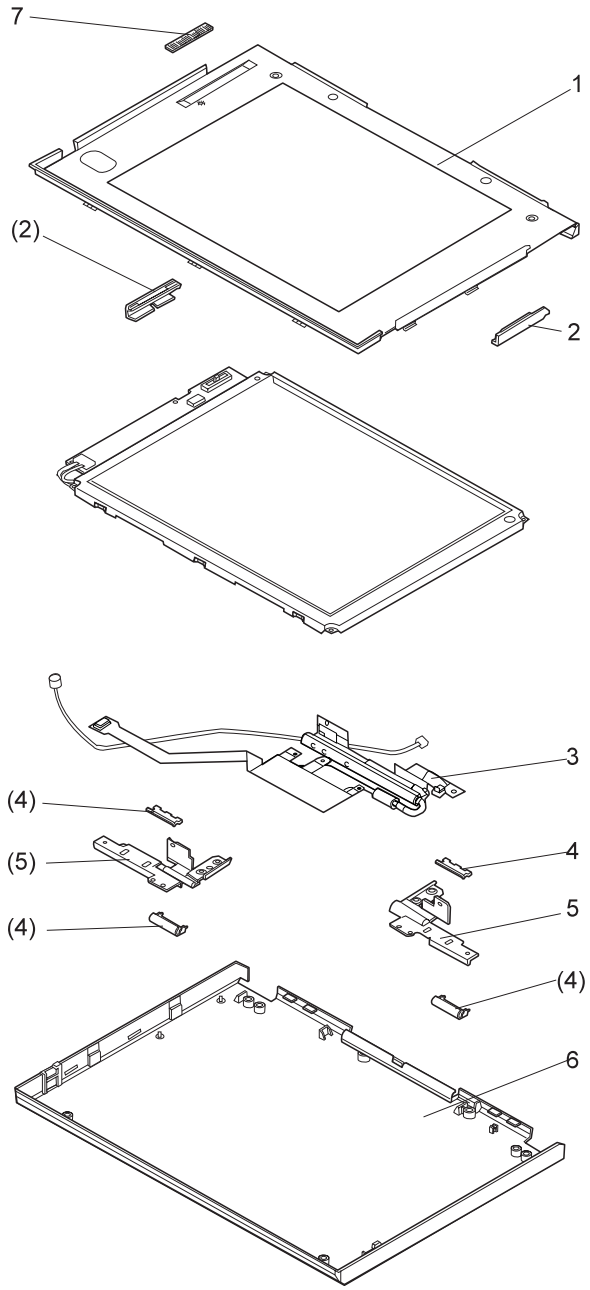
LCD Unit, 10.4 VGA (P/N 46H5355)



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LCD Cover Group 46H5712

Note

Includes the following parts:

1 Front Cover
2 Guide (R/L)
4 Hinge Cover (R/L)
6 Rear Cover
7 Slide Knob
- Screw Cap
- Screw
- Tape

Hinge Group 46H5715

Note

Includes the following parts:

5 Hinge (R/L)
- Screw Cap

Interface Cable Group 46H5720

Note

Includes the following parts:

3 Interface Cable Assembly
- Screw Cap

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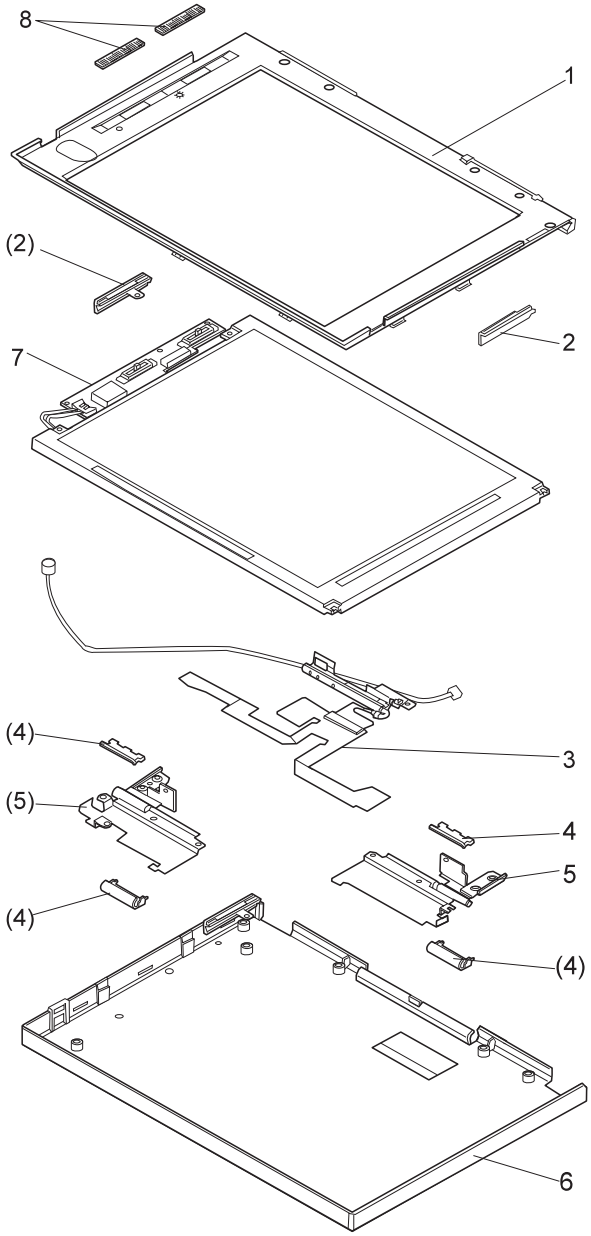
LCD Unit, 11.3 DSTN (P/N 39H6232)



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LCD Cover Group 46H5713

Note

Includes the following parts:

1 Front Cover
2 Guide (R/L)
4 Hinge Cover (R/L)
6 Rear Cover
8 Slide Knob
- Screw Cap
- Screw
- Tape

Hinge Group 46H5716

Note

Includes the following parts:

5 Hinge (R/L)
- Screw Cap

Interface Cable Group 46H5721

Note

Includes the following parts:

3 Interface Cable Assembly
- Screw Cap

Inverter Card Group 46H5722

Note

Includes the following parts:

7 Inverter Card
- Screw Cap

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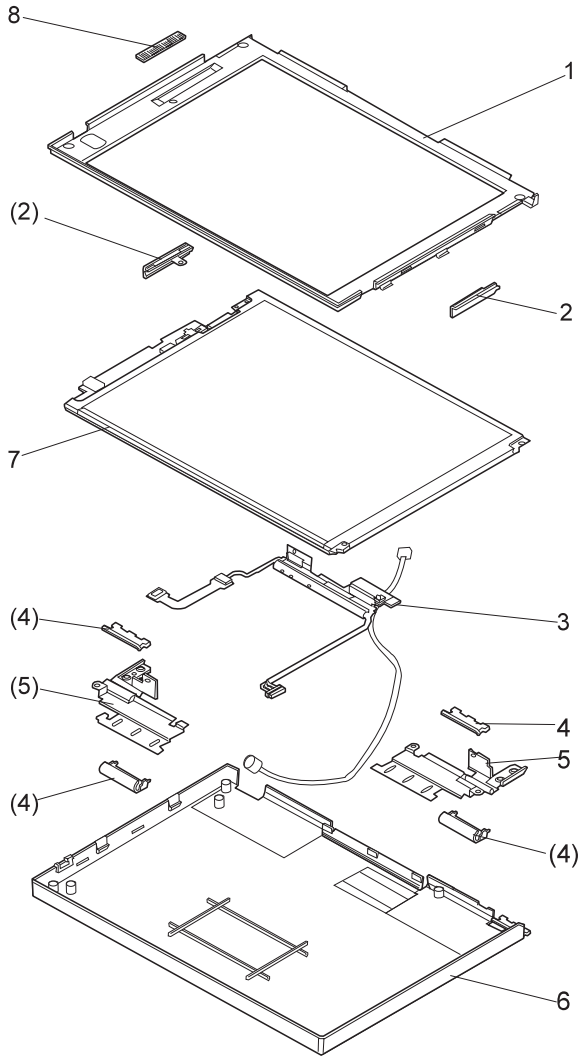
LCD Unit, 12.1 XGA (P/N 46H5735)



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LCD Cover Group 82H8891

Note

Includes the following parts:

1 Front Cover
2 Guide (R/L)
4 Hinge Cover (R/L)
6 Rear Cover
7 Bracket Spacer
8 Slide Knob
- Screw Cap
- Screw
- Tape

Hinge Group 82H8892

Note

Includes the following parts:

5 Hinge (R/L)
- Screw Cap

Interface Cable Group 82H8893

Note

Includes the following parts:

3 Interface Cable Assembly
- Screw Cap

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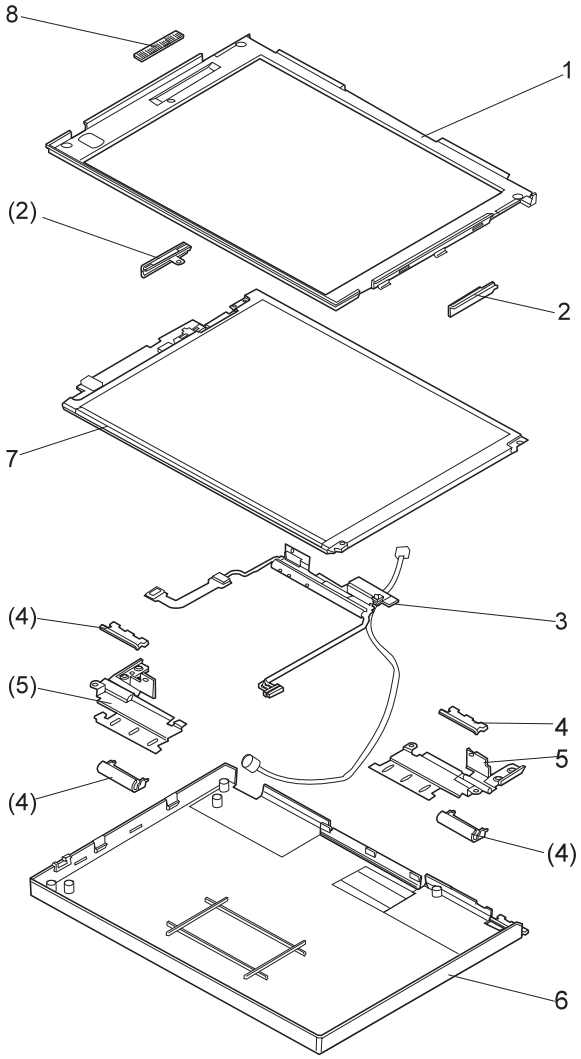
LCD Unit, 12.1 XGA (P/N 46H5735, ASM P/N 46H5731)



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LCD Cover Group 46H5736

Note

Includes the following parts:

1 Front Cover
2 Guide (R/L)
4 Hinge Cover (R/L)
6 Rear Cover
7 Bracket Spacer
8 Slide Knob
- Screw Cap
- Screw
- Tape

Hinge Group 82H8892

Note

Includes the following parts:

5 Hinge (R/L)
- Screw Cap

Interface Cable Group 46H5737

Note

Includes the following parts:

3 Interface Cable Assembly
- Screw Cap

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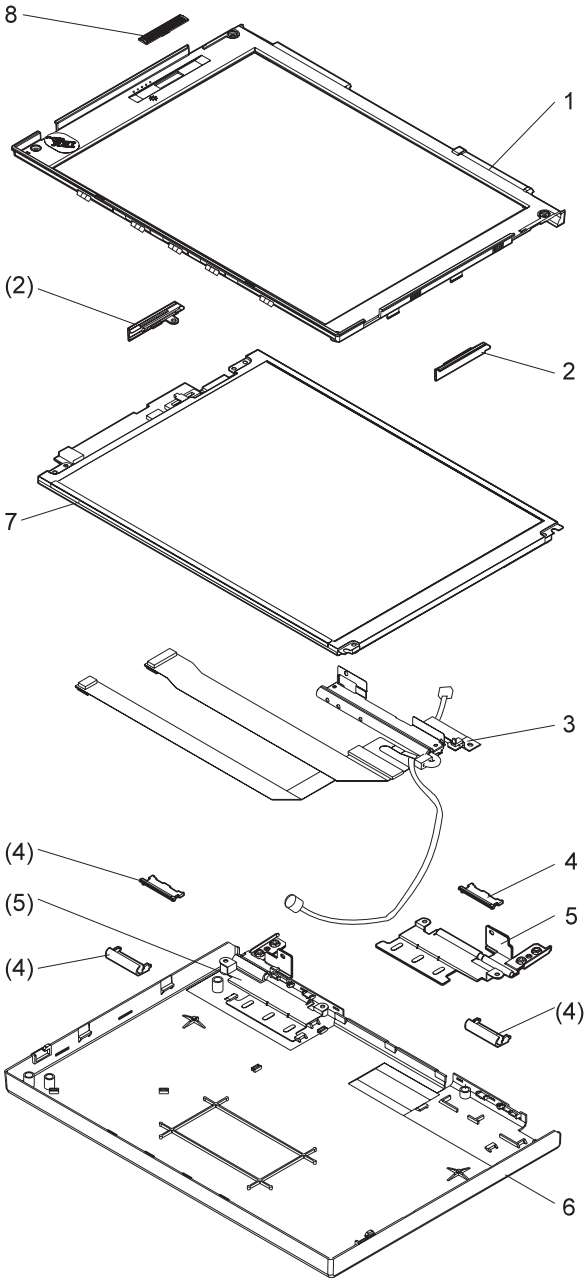
LCD Unit, 12.1 SVGA (P/N 82H8496)



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LCD Cover Group 82H8891

Note

Includes the following parts:

1 Front Cover
2 Guide (R/L)
4 Hinge Cover (R/L)
6 Rear Cover
7 Bracket Spacer
8 Slide Knob
- Screw Cap (4)
- Screw
- Tape

Hinge Group 82H8892

Note

Includes the following parts:

5 Hinge (R/L)
- Screw Cap

Interface Cable Group 82H8894

Note

Includes the following parts:

3 Interface Cable Assembly
- Screw Cap

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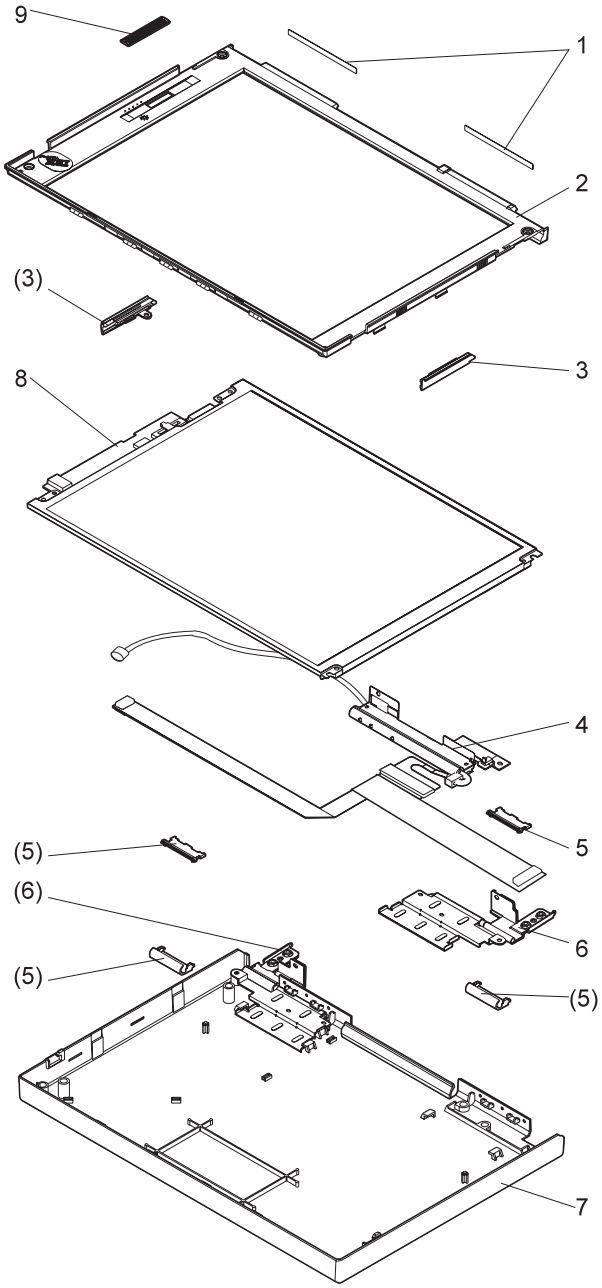
LCD Unit, 12.1 SVGA (P/N 46H5725)



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LCD Cover Group 46H5726

Note

Includes the following parts:

1 Screw Cap, Large
2 Front Cover
3 Guide (R/L)
5 Hinge Cover (R/L)
7 Rear Cover
8 Slide Knob
- Screw Cap
- Screw
- Tape

Hinge Group 46H5714

Note

Includes the following parts:

6 Hinge (R/L)
- Screw Cap

Interface Cable Group 46H5738

Note

Includes the following parts:

4 Interface Cable Assembly
- Screw Cap

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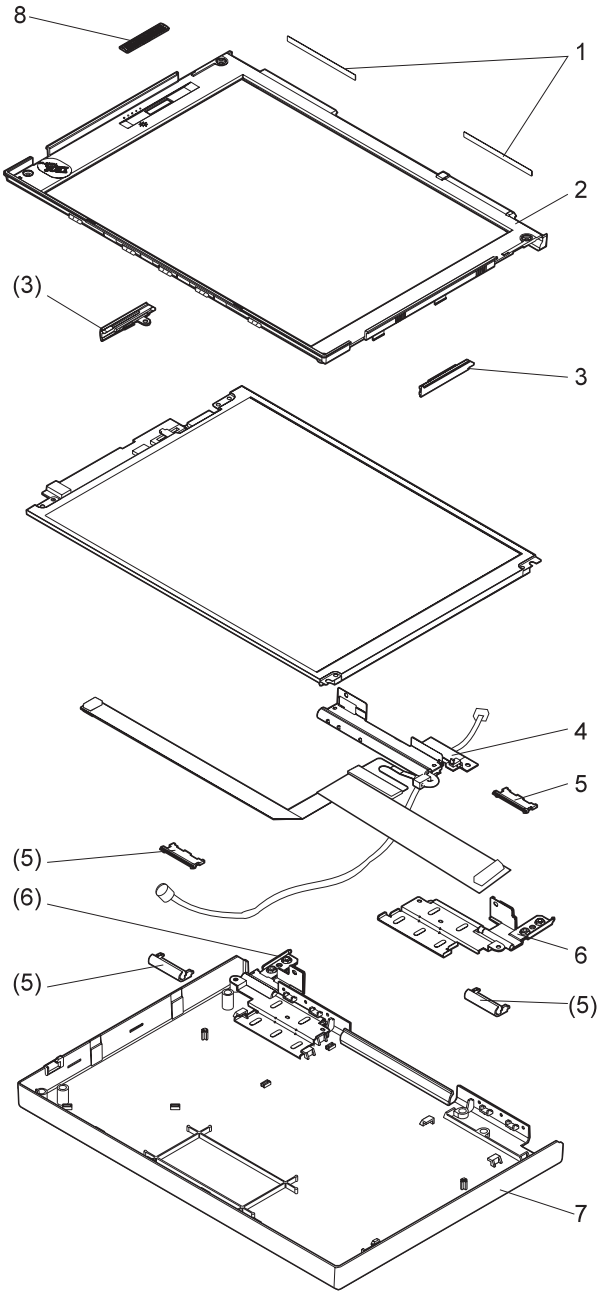
LCD Unit, 12.1 SVGA (P/N 11J8867, ASM P/N 11J8855)



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LCD Cover Group 11J8868

Note

Includes the following parts:

1 Screw Cap, Large
2 Front Cover
3 Guide (R/L)
5 Hinge Cover (R/L)
7 Rear Cover
9 Slide Knob
- Screw Cap
- Screw
- Tape

Hinge Group 11J8869

Note

Includes the following parts:

6 Hinge (R/L)
- Screw Cap

Interface Cable Group 11J8870

Note

Includes the following parts:

4 Interface Cable Assembly
- Screw Cap

Inverter Card (**8**) 11J9621

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Common or Option Parts List

Miscellaneous Parts

Security Parts Kit	29H9294
(Includes the following:)	
Keyboard Security Plate (760C)	
Keyboard Security Plate (760CD)	
PC Card Security Plate (760C)	
PC Card Security Plate (760CD)	
PC Card Security Stopper	
Keyboard Security Plate for Dock (760C)	
Keyboard Security Plate for Dock (760CD)	
Screw Kit	39H7003
(Includes the following:)	
M2.5 x 6 Screw (5)	
M2.5 x 4 Screw (10)	
M2.5 x 8 Screw (5)	
M2.5 Nut (10)	
Hex Stud D-Sub (5)	
Hex Stud Bus (5)	
M2.5 x 8 Flathead (5)	
M2 x 4 (5)	
Screw Cover for Top cover (5)	
M2.5 x 4 Flathead (5)	
M2.5 x 5 Flathead (5)	
Nut M2.5 (5)	
M2.6 x 5 Deform (5)	
M2.5 x 14 (5)	
M2.5 x 4 Thin Head (5)	
M1.4 x 1.8 Thin Head (5)	
M2 x 4.3 Thin Head (5)	
Nylon Screw Kit	97H3449
(Includes the following:)	
M2.5 x 4 (20)	
M2.5 x 6 (15)	
M2.5 x 8 (10)	
M2.5 x 14 (5)	
M2 x 14 (5)	

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DAA Assembly

Connector for EMEA	12J1572
Austria	59G1041
Australia	59G1040
Belgium	43G3414
Denmark	59G1042
Finland	54F0715
France	4525652
Germany	77H9765
Malaysia	59G1066
Netherlands	80G3480
Norway	59G1044
New Zealand	80G4584
PRC and Hong Kong	54F0693
Sweden	54F0717
Switzerland	59G1057
Taiwan	59G1067
Thailand	59G1064
U.K.	59G1045

PSTN Cable

Austria	58G4386
Australia	58G4343
Belgium	58G4346
Denmark	58G4333
Finland	58G4334
France	58G4335
Germany	58G4347
U.S., Thailand, Malaysia, Singapore, and Hong Kong	43G3398
Netherlands	58G4340
New Zealand and PRC	58G4332
Norway	58G4334
Sweden	58G4336
Switzerland	58G4348
U.K.	58G4345

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Options

Notes:

1. When you replace the AC Adapter or the Quick Charger, use the one for the country you are in, even if the computer is from a different country.
2. The warranty for the system unit does not apply to all options.

810MB Hard Disk Drive Assembly	29H9366
1.08GB Hard Disk Drive Assembly	29H9367
5.1GB Hard Disk Drive Assembly	00K7907
Audio Cable	66G5180
Battery Pack (NiMH)	29H9233
Battery under Spacer	29H9369
Cable Travel Charger Assembly	85G1531
Car-Battery Adapter	49G1148
Conversion Cable (Game Port)	29G9269
Conversion Cable (Video)	85G1897
DIMM 8MB (760Cx/760Lx)	29H9287
DIMM 16MB	29H9288
External Battery Under Spacer	29H9369
External Diskette Drive Box Kit	66G5069
FDD (4-mode 2.88MB)	29H9372
FDD External Box Kit	66G5069
Hard Disk Drive over Pack	39H7040
Headset	85G1529
Interface Cable to System for Keyboard	84G2531
Interface Cable to Keyboard for Keypad	84G2532
Mini-DIN to Mini-DIN Cable	84G6474
Microphone	66G7871
Model Label	46H6034
Name Label	66G9228
PCMCIA Cartridge	84G1303
PCMCIA RF Cartridge	84G1304
Port Replicator	66G3575
Port Replicator with PCMCIA	66G3574
PS/2 Miniature Mouse	95F5723
Quick Charger	85G1530
Quick Charger Cable	85G1531
Second HDD Tray	29H9295
Small Car-Battery Adapter	84G4359
Travel Charger Assembly	85G1530
Wall Plug	85G2367
SO-DIMM 8 MB (760Ex)	42H2767
SO-DIMM 16 MB (760Ex)	42H2768
SO-DIMM 32 MB (760Ex)	42H2769

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Numeric Keypad

Belgian	95F5741
Canadian French	95F5466
Danish	95F5467
Dutch	95F5467
French	95F6313
German	95F6314
Greek	95F5467
Hebrew	95F5741
Icelandic	95F5467
Italian	95F6316
Japanese	79F6401
Norwegian	95F5467
Spanish	95F6315
Swedish or Finnish	95F5468
Swiss (French)	95F5711
Swiss (German)	95F5715
Turkish	95F5467
U.K. English	95F5741
U.S. English	95F5741

Black Keypad

French	84G6286
German	84G6280
Italian	84G6292
Norwegian	84G6310
Swedish	84G6304
U.K. English	84G6298
U.S. English	84G2530

Black Keyboard

French	84G6285
German	84G6279
Italian	84G6291
Norwegian	84G6309
Swedish	84G6303
U.K. English	84G6297
U.S. English	84G2529

Accessories

Keyboard/Mouse Cable	54G0444

Tools

Tri-Connector Wrap Plug	72X8546
PC Test Card	35G4703
Audio Wrap Cable	66G5180
Screwdriver Kit	95F3598
ThinkPad Hardware Maintenance Diskette Version 1.30	82G3891

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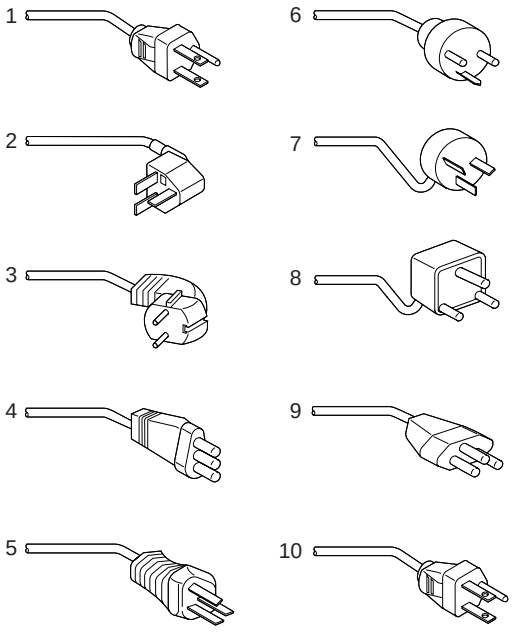
Power Cords



Warning:
Use the power cord certified for your country.

3-Prong

1	Colombia, U.S., Venezuela	25H2207
	Korea	25H2207
	Japan, 2-prong	85G6665
2	Hong Kong, Singapore, U.K.	25H2215
3	France, Germany, Spain	25H2209
4	Italy	25H2223
5	Australia, New Zealand	25H2205
6	Denmark	25H2211
7	Israel	25H2225
8	Bangladesh, Pakistan, Sri Lanka, South Africa	25H2213
9	Switzerland	25H2221
10	Thailand	25H2219

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2-Prong Slim

1	Colombia, U.S., Venezuela	13H5264
	Korea	13H5264
	Japan	13H5273
2	Hong Kong, Singapore, U.K.	14F0033
3	France, Germany, Spain	13H5270
4	Italy	13H5270
5	Australia, New Zealand	13H5276
6	Denmark	13H5270
7	Israel	13H5270
8	Bangladesh, Pakistan, Sri Lanka, South Africa	13H5279
9	Switzerland	13H5270
10	Thailand	13H5264

3-Prong Slim

1	Colombia, U.S., Venezuela	76H3516
	Korea	76H3535
	Japan	76H3526
2	Hong Kong, Singapore, U.K.	76H3524
3	France, Germany, Spain	76H3518
4	Italy	76H3530
5	Australia, New Zealand	76H3514
6	Denmark	76H3520
7	Israel	76H3532
8	Bangladesh, Pakistan, Sri Lanka, South Africa	76H3522
9	Switzerland	76H3528
10	Thailand	76H3516

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Read This First

Before you go to the checkout guide, be sure to read this section.

Important Notes

- **Only certified trained personnel should service the computer**.
- Read FRU service procedures before replacing any FRUs.
- **Be extremely careful during write operations, copying, saving, or formatting.** Drives in the computer that you are servicing might have been rearranged, or the drive startup sequence might have been altered. If you select an incorrect drive, data or programs can be written over.
- **Replace FRUs only for the correct model.** When you replace the FRU, make sure the model of the machine and FRU part number are correct by referring to the parts list.
- **FRUs should not be replaced because of a single, unreproducible failure.** Single failures can occur for a variety of reasons that have nothing to do with a hardware defect, such as: cosmic radiation, electrostatic discharge, or software errors. FRU replacement should be considered only when a recurring problem exists. If this is suspected, clear the error log and run the test again. Do not replace any FRUs if log errors do not reappear.
- **Be careful not to replace a nondefective FRU.**

How to Use Error Messages: Use the error codes displayed on the screen to diagnose failures. If more than one error code is displayed, begin the diagnosis with the first error code. The cause of the first error code can cause subsequent error codes to be false. If no error code is displayed, see if the error symptom is listed in the “Symptom-to-FRU Index” on page 432.

Port Replicator Problems: If you suspect a problem with the Port Replicator, see “Port Replicator Checkout” on page 428.

How to Diagnose Multiple FRUs: If the adapter or device has more than one FRU, the error code could be caused by either FRU. Before replacing multiple FRUs, try removing or exchanging each FRU, one by one in the designated sequence, to see if the symptoms change.

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What to Do First: The servicer must include the following in the parts exchange form or part return form that is attached to the returned FRU:

___ 1. Name and phone number of servicer
___ 2. Date of service
___ 3. Date when part failed
___ 4. Date of purchase
___ 5. Failure symptoms, error codes appearing on display, and beep symptoms
___ 6. Procedure index and page number in which failing FRU was detected
___ 7. Failing FRU name and part number
___ 8. Machine type, model number, BIOS level, and serial number
___ 9. Customer's name and address

Before checking problems with the computer, determine whether the damage is covered under the warranty by referring to the following:

Warranty Notes:

1. Check the ECAs (Engineering Change Announcements) of the device that pertain to the system failure before billing the customer.
2. During the warranty period, the customer may be responsible for repair costs if the computer damage was caused by misuse, accident, modification, unsuitable physical or operating environment, or improper maintenance by the customer. The following list provides some common items that are not covered under warranty and some symptoms that may indicate that the system was subjected to stresses beyond normal use:

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Important Notes

The following is not covered under warranty:

- LCD panel cracked from the application of excessive forces, shock, or from being dropped
- Scratched (cosmetic) parts
- Cracked or broken plastic parts, broken latches, broken pins, or broken connectors caused by excessive force
- Damage caused by liquid spilled into the system
- Damage caused by improper insertion of a PCMCIA Card or the installation of an incompatible card
- Damage caused by foreign material in the FDD or UltraBay
- Diskette drive damage caused by the diskette drive cover being pressed or by the insertion of diskettes with multiple labels
- Damaged or bent diskette eject button
- CD-ROM drive damage caused by excessive forces shock, or by being dropped
- Fuses blown by the attachment of a nonsupported device
- Forgotten computer or hard disk password (making the computer or hard disk unusable)

If the following symptoms are present, they may indicate damage caused by nonwarranted activity:

- Missing parts might be a symptom of unauthorized service or modification.
- HDD spindles can become noisy from being subjected to excessive force or from being dropped.
- I9990303 errors can be caused by exposure to strong magnetic fields.

How to Disable the Power-On Password:

1. Power off the computer.
2. Open the keyboard, and remove the diskette drive or CD-ROM drive.
3. Install a jumper on the power-on password connector on the left side of the FDD connector.
4. Reinstall the battery pack and the diskette drive/CD-ROM drive.
5. Power on the computer and wait until the POST ends.
6. Verify that the password prompt does not appear.
7. After the service check is completed, remove the jumper.

To reactivate the password, set the password again.

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Supervisor and Hard Disk Passwords: The supervisor password and the hard disk password (HDP) are security features that are used to protect the system and the hard disk data from unauthorized access. No overriding capability is provided. If only a hard disk password is set, obtaining permission from the password owner to unlock the password is a prerequisite for running diagnostic tests and performing service. If both supervisor password and hard disk password are set, you can enter Easy-Setup by pressing the **Enter** key or power-on password at the supervisor password prompt. In this case, the **Password**, **Start up**, and **Initialize** icons cannot be selected.

See “Password Combinations (POP, HDP, PAP)” on page 451 for more information about passwords.

Note: The supervisor password and hard disk password cannot be replaced If they are forgotten. If the customer forgets the supervisor password, the system board must be replaced. If the customer forgets the hard disk password, the hard disk drive must be replaced.

Power Shutdown Switch: The power shutdown switch resets the system regardless of the microcode status and forces the power off. Use this push button to power-off when power is not completely off or the microcode is in a hung state.

See “Rear View” on page 504 for the power shutdown switch.

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Checkout Guide

Use the following procedure as a guide for computer problems.

Note: The diagnostic tests are intended to test only IBM products. Non-IBM products, prototype cards, or modified options can give false errors and invalid system responses.

1. Obtain the failing symptoms in as much detail as possible.
2. Verify the symptoms by attempting to re-create the failure by running the diagnostic test or by repeating the same operation.

   Note: To run the diagnostics, refer to "Running the Diagnostics" on page 449.

3. Use the following table with the verified symptom to determine which page to go to. Search the symptoms column, and find the description that best matches your symptom; then go to the page shown in the "Go To" column.

Symptoms (Verified)	Go To
Power failure. (The power indicator does not go on or stay on.)	"Power Systems Checkout" on page 422.
POST does not complete. No beeps or error codes are displayed.	"Symptom-to-FRU Index" on page 432, and then use the **No Beep Symptoms** table.
The configuration is not the same as the installed devices.	"Checking the Installed Devices List" on page 450.
POST beeps, but no error codes are displayed.	"Symptom-to-FRU Index" on page 432, and then use the **Beep Symptoms** table.
POST detected an error and displayed numeric error codes.	"Symptom-to-FRU Index" on page 432, and then use the **Numeric Error Codes** table.
The diagnostic test detected an error and displayed a FRU code.	"FRU Codes" on page 438.
Other symptoms (such as LCD display problems).	"Symptom-to-FRU Index" on page 432, and then use the other symptom table.
Symptoms cannot be re-created. (Intermittent problems).	Use the customer-reported symptoms and go to "Symptom-to-FRU Index" on page 432.

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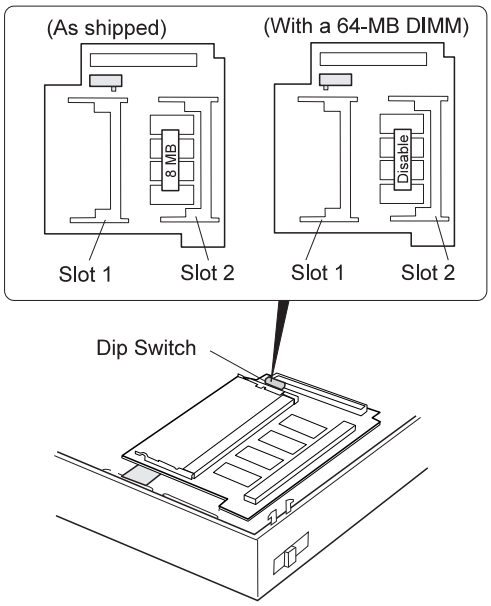
Memory Checkout

DIMMs are available for increasing memory capacity.

Note: The Models 765L and 765D have a dip switch on the DIMM adapter card. If you are installing a 64-MB 2-bank DIMM, move the the dip switch to the left. The memory (8 MB) on the DIMM adapter card is disabled.

You can install a 64-MB 2-bank DIMM in slot 2. If you try to install the it in slot 1, it will not be recognized as 64MB DIMM.



Dip Switch	Slot 1	Slot 2	Total Memory	Displayed Value
Right	16MB	0MB	32MB	32384KB
Right	16MB	8MB	40MB	40576KB
Right	16MB	16MB	48MB	48768KB
Right	16MB	32MB	64MB	65152KB
Right	32MB	32MB	80MB	81536KB
Left	16MB	64MB	88MB	89728KB
Left	32MB	64MB	104MB	106112KB

Memory errors might stop system operations, show error messages on the screen, or hang the system.

Use the following procedure to isolate memory problems:

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Note: Make sure that the DIMM adapter card is fully installed into the connector. A loose connection can cause an error.

1. Power off the computer and remove the DIMM adapter card from its slot (if installed).
2. Press and hold the **F1** key; then power on the computer. Hold the **F1** key down until the Easy-Setup screen appears.
3. Select **Test** and press **Enter**.
4. Select **Memory** and press **Enter** to run the memory test on base memory. If an error appears, replace the system board.
5. Power off the computer and reinstall the DIMM adapter card; then power on the computer. Verify the memory size; then test the memory. If an error appears, replace the DIMM adapter card.

If memory problems occur intermittently, use the loop option to repeat the test. When the test detects an error, an error log is printed on the printer connected to the parallel port. See "Displaying the Error Log" on page 450 for more information.

System Programs in Flash Memory: System setup programs and diagnostic tests are stored in flash memory.

Flash Memory Update: A flash memory update is required for the following conditions:

- New versions of system programs
- New features or options

To update the flash memory, do the following:

1. Get the appropriate diskette containing the update.
2. Insert the System Program Service diskette into drive A, and power on the computer with ac power and a fully charged battery.
3. Select **Update system programs** from the menu.

System Board and CPU Card Checkout

The processing functions are performed by both the system board and the CPU card. Processor problems can be caused by either FRU. However, the CPU card generally has a lower probability of failure. If a numeric code indicates the system board or the CPU card as a failing FRU, or the CPU card is indicated by a diagnostic test by showing FRU code 11, use the following procedure to isolate the problem:

1. Run the system board test to verify the symptom. This test verifies both the system board and the CPU card. If no error is detected, return to "Checkout Guide" on page 415.

   Note: Don't touch the keyboard and pointing device when the system board test is running. This may cause an unexpected error.

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2. If FRU code 10 appears, replace the system board but do not replace the CPU card. Transfer the CPU card from the old system board to the new system board.
3. If FRU code 11 appears, reseat the CPU card.
4. Rerun the test to verify the fix.
5. If FRU code 11 remains, replace the CPU card.

If this procedure does not correct the problem, go to “Undetermined Problems” on page 447.

Keyboard or Auxiliary Input Device Checkout

Remove the external keyboard if the internal keyboard is to be tested.

If the internal keyboard does not work or an unexpected character appears, make sure that the flexible cable extending from the keyboard is correctly seated in the connector on the video card.

If the keyboard cable connection is correct, check the DSP card (see “1170 DSP Card or ESS Card” on page 480) or Audio (ESS) card (see “Audio (ESS) Card Checkout (765L)” on page 419).

If the tests do not detect a keyboard problem, run the **keyboard test** by doing the following:

1. Go to the diagnostic menu screen by selecting **Test** in the Easy-Setup menu.
2. Press **Ctrl**+**A** to enter to the advanced diagnostic mode.
3. Press **Ctrl**+**K**; a layout of the keyboard appears on the screen.
4. Check that when each key is pressed, the key's position on the keyboard layout on the screen changes to a black square.

   Note: When the **Fn** key is pressed, a black square briefly appears.
5. Press **Ctrl**+**Pause** to end the test.

If the tests detect a keyboard problem, do the following one at a time to correct the problem. Do not replace a nondefective FRU.

- Reseat the keyboard card cable.
- Replace the keyboard card cable.
- Replace the keyboard card assembly.
- Replace the video card.
- Replace the system board.

The following auxiliary input devices are supported for this computer:

- Numeric keypad
- Mouse (PS/2 compatible)
- External keyboard (with keyboard/mouse cable)

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If any of these devices do not work, reseat the cable connector and repeat the failing operation.

If the problem does not recur, recheck the connector.

If the problem is not corrected, replace the device, and then the system board.

DSP Card Checkout (Model 765D)

1. Go to the diagnostic menu screen by selecting **Test** in the Easy-Setup menu.
2. Select **DSP** and run the diagnostic tests.
3. If the test detects a DSP card problem, replace the DSP card.

Audio (ESS) Card Checkout (765L)

1. Go to the diagnostic menu screen by selecting **Test** in the Easy-Setup menu.
2. Select **Audio** and run the diagnostic tests.
3. If the test detects a audio (ESS) card problem, replace the audio (ESS) card.

TrackPoint III Checkout

If the TrackPoint III does not work, check the configuration in the ThinkPad Configuration program. If the configuration of the TrackPoint III is disabled, select **Enable** to enable it.

If this does not correct the TrackPoint III problem, continue with the following:

The TrackPoint III does automatic compensations to adjust the pointer sensor. During this process, the pointer moves on the screen automatically for a short time. This self-acting pointer movement can occur when a slight, steady pressure is applied to the TrackPoint III pointer while the computer is powered on or while the system is running, or when readjustment is required because the temperature has exceeded its normal temperature range. This symptom does not indicate a hardware problem. No service actions are necessary if the pointer movement stops in a short period of time.

If a click button problem or pointing stick problem occurs, do the following:

1. Go to the Easy-Setup menu.
2. Select an item with the pointing stick.
3. Press either the left or right click button.
4. Verify that both buttons work correctly.

If either the pointing stick or the click button does not work, do the following actions one at a time to correct the problem. Do not replace a nondefective FRU.

- Reseat the keyboard card cables.
- Replace the keyboard card cables.
- Replace the keyboard card assembly.

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- Replace the video card.
- Replace the system board.

Game Port Checkout

Do the following if a joystick problem occurs:

1. Connect the joystick to the game port.
2. Go to the Easy-Setup menu.
3. Select an item with the joystick.
4. Press any button of the joystick.
5. Verify that all buttons work correctly.

If either the joystick or a button does not work, replace the video card. If the problem persists, replace the system board.

Diskette Drive Checkout

Do the following to isolate the problem to a controller, drive, or diskette. A scratch, write-enabled, nondefective 2HD diskette is required.

Note: The data on the diskette is altered during this test. Back up the data on the diskette, or use a blank formatted diskette.

FDD-1 represents a diskette drive in the UltraBay. *FDD-2* represents the port replicator, expansion unit, or diskette drive attached through the external diskette drive connector.

Warning: Make sure that the diskette does not have more than one label attached to it. Multiple labels can cause damage to the drive or cause the drive to fail.

Do the following to select the test device:

1. Select the advanced diagnostics mode and select **Tool**; then select **FDD-1** or **FDD-2** and press the **Spacebar**. A √ mark appears next to the selected icon.
2. Press **Enter.**
3. Insert the *blank* diskette when instructed.
4. Type **Y** (Yes) to the question on the screen.
5. Select **FDD-1** or **FDD-2** and press **Enter** to run the diskette drive test.
6. If the controller test detects an error, FRU code 10 appears. Replace the system board.
7. If the controller test runs without errors, the drive read/write tests start automatically.
8. If the drive test detects an error, FRU code 50 for FDD-1; or 51 for FDD-2 appears. If the diskette itself is known to be good, replace the drive.
9. If FDD-2 test detects an error, move the drive to the computer's diskette drive connector directly, if possible, and test it again as FDD-1.

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If no errors occur in the FDD-1 position, the drive is not defective. Go to “Port Replicator Checkout” on page 428 to isolate the replicator problem.

10. If the drive is attached through an Expansion Unit, go to the service manual of the Expansion Unit to isolate the problem.
11. If the drive is attached through a Diskette Drive Attachment Unit, replace the unit.
12. If no error occurred when testing the formatted diskette, suspect the diskette that was used when the customer reported the problem.

If an error occurs when the external diskette drive is attached through the external diskette drive connector and there is not a diskette drive in the UltraBay, reseat the connector on the video card. If the error persists, reseat the external diskette drive connector. If the error persists, replace the following FRUs one at a time:

1. External diskette drive kit
2. Video card
3. External diskette drive connector

LCD Information Panel Checkout

If an LCD information panel problem occurs, do the following:

1. Power off the computer.
2. Power on the computer.
3. All the icons in the LCD information panel appear for a moment soon after the computer is powered on. Verify that all icons appear correctly.

   If some of the icons do not appear, replace the keyboard.

If the problem persists, replace the video card.

Fan Checkout

To check the fan, do the following:

1. Turn off the computer.
2. Remove the following FRUs (see “FRU Removals and Replacements” on page 454):
   a. Diskette drive/CD-ROM drive
   b. Battery pack
   c. Hard disk drive
   d. Top cover
   e. Keyboard unit
3. Attach the AC Adapter to the computer.
4. Applying a short across the two pads with a screw driver as shown below, turn on the computer.

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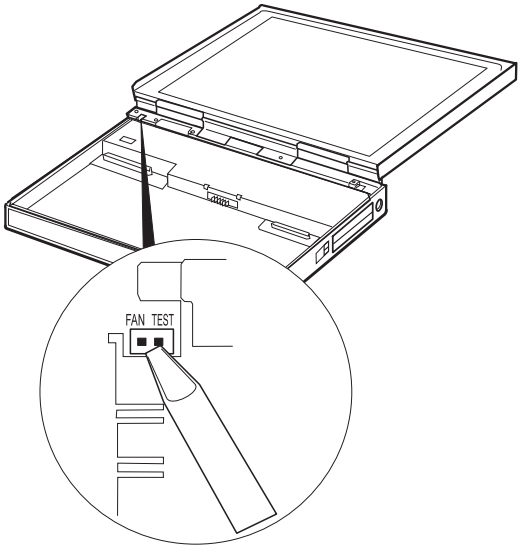

5. Listen for the fan. If the fan does not run, replace it.

Power Systems Checkout

To verify the symptom of the problem, power on the computer using each of the power sources as follows:

1. Remove the battery pack, diskette drive, and hard disk drive.
2. Connect the AC Adapter and check that power is supplied.
3. Install the diskette drive or hard disk drive one at a time, and check that power is supplied from each power source.
4. Disconnect the AC Adapter, remove the hard disk and diskette drive, and install the charged battery pack; then check that power is supplied by the battery pack.

If you suspect a power problem, see the appropriate power supply check in the following list:

- "Checking the AC Adapter"
- "Checking Operational Charging" on page 423
- "Checking the Battery Pack" on page 424
- "Checking the Car-Battery Adapter" on page 425
- "Checking the Backup Battery (Nonrechargeable)" on page 426
- "Checking the Standby Battery (Rechargeable)" on page 427

Checking the AC Adapter: You are here because the computer fails only when the AC Adapter is used.

- If the power problem occurs only when the port replicator is used, replace the replicator.

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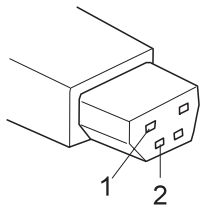
- If the power on indicator does not turn on, check the power cord of the AC Adapter for correct continuity and installation.
- If the operational charge does not work, go to "Checking Operational Charging."

1. Unplug the AC Adapter cable from the computer and measure the output voltage at the plug of the AC Adapter cable. See the following figure:



Pin	Voltage (V dc)
1	+15.5 to +17.0
2	Ground

   - If the voltage is correct, make sure the connection between DC/DC card and system board is not loose.
   - Replace the DC/DC card.
   - If the problem is not corrected, replace the system board.
   - If the problem is still not corrected, go to "Undetermined Problems" on page 447.
   - If the voltage is not correct, go to the next step.
2. Unplug the AC Adapter cable from the ac power outlet and wait 5 minutes or longer to allow the overvoltage protection circuit to be fully discharged and initialized.
3. Plug the AC Adapter cable into the ac power outlet.
4. Measure the output voltage of the AC Adapter.
5. If the voltage is still not correct, replace the AC Adapter.

Note: An audible noise from the AC Adapter does not always indicate a defect.

Checking Operational Charging: To check operational charging, use a discharged battery pack or a battery pack that has less than 50% of the total power remaining when installed in the computer.

Perform operational charging. If the battery status indicator does not turn on, remove the battery pack and let it return to room temperature. Reinstall the battery pack. If the charge indicator still does not turn on, replace the battery pack.

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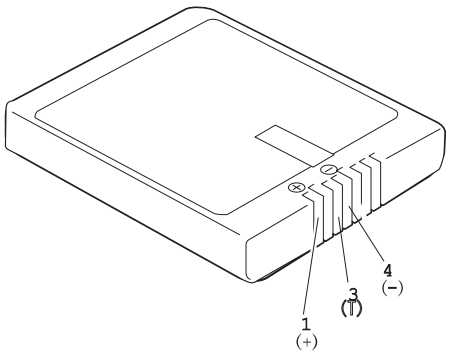
Checking the Battery Pack: Battery charging will not start until the Fuel-Gauge shows that less than 95% of the total power remains; with this condition the battery pack will charge to 100% of its capacity. This protects the battery pack from being overcharged or having a shortened life.

Do the following:

1. Power off the computer.
2. Remove the battery pack and measure the voltage between battery terminals 1 (+) and 4 (–). See the following figure:



Terminal	Voltage (V dc) / Signal
1	**+0 to +13.5**
2	Send
3	**Thermal**
4	**Ground (–)**
5	Select

Note: Signal lines not used in these steps are used for communication between the system and the battery.

3. If the voltage is less than +11.0 V dc, the battery pack has been discharged. Recharge the battery pack.

   If the voltage is still less than +11.0 V dc after recharging, replace the battery.

   Note: If the voltage of the battery pack is 0 V, it is defective.

4. If the voltage is more than +11.0 V dc, measure the resistance between battery terminals 3 and 4. The resistance must be 4 to 30 K ohm.

   If the resistance is not correct, replace the battery pack.

   If the resistance is correct, replace the DC/DC card.

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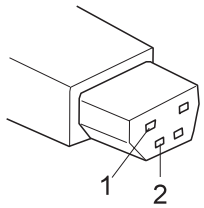
Checking the Car-Battery Adapter

1. Unplug the Car-Battery Adapter cable from the computer.
2. Plug the Car-Battery Adapter into the cigarette lighter socket.

   Note: If the adapter is already plugged in, reseat it.
3. Measure the output voltage of the Car-Battery Adapter cable. See the following figure:

   Note: The Car-Battery Adapter does not charge the battery pack when the computer is powered on. This is not a failure of the Car-Battery.



Pin	Voltage (V dc)
1	+19.0 to +21.0
2	Ground

   - If the voltage is correct, the Car-Battery Adapter is working correctly. Check that the computer runs with the AC Adapter. If it runs correctly with the AC Adapter, check the system board. If the problem still remains, replace the following FRUs one at a time.
     a. DC/DC card
     b. System board

     If the problem is not resolved when the system board is replaced, go to “Undetermined Problems” on page 447.
   - If the voltage is outside the normal voltage range, do one of the following:
     – Try these test procedures in a different car, if one is available.
     – Replace the Car-Battery Adapter if the computer works correctly with the AC Adapter.

Note: If the output voltage from the cigarette lighter socket of the car is less than 10.5 V dc, a continuous noise may be heard. The condition of the car battery should be checked by appropriate service personal.

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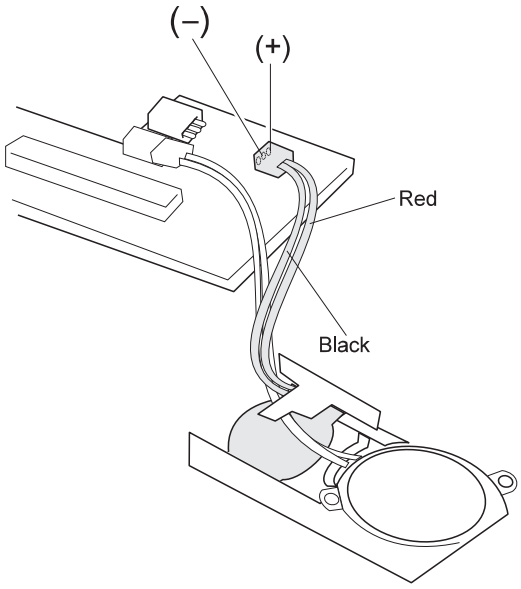
Checking the Backup Battery (Nonrechargeable)

1. Power off the computer and unplug the AC Adapter from the computer.
2. Open the keyboard, and remove the diskette drive/CD-ROM drive, the battery pack, and the hard disk drive.
3. Remove the top cover and keyboard unit.
4. Open the keyboard unit; then remove the keyboard card.
5. Remove the backup battery from the keyboard card. (Refer to “2060 Backup Battery, Speaker, Standby Battery” on page 494 to remove the battery.)
6. Measure the voltage of the backup battery connector. See the following figure:



Wire	Voltage (V dc)
Red	+2.5 to +3.7
Black	Ground

- If the voltage is correct, replace the system board.
- If the voltage is not correct, the backup battery has been discharged. Replace the backup battery.
- If the backup battery discharges quickly after replacement, replace the system board.

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Checking the Standby Battery (Rechargeable)

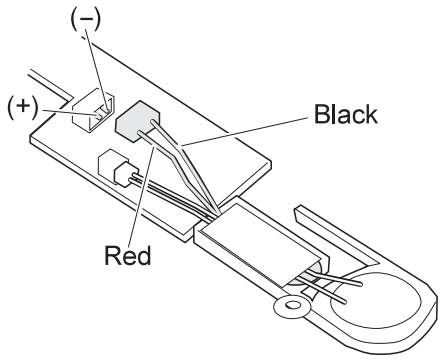
1. Power off the computer and unplug the AC Adapter from the computer.
2. Open the keyboard, and remove the diskette drive/CD-ROM drive, the battery pack, and the hard disk drive.
3. Remove the top cover and keyboard unit.
4. Open the keyboard unit; then remove the keyboard card.
5. Remove the standby battery from the keyboard card. (Refer to “2060 Backup Battery, Speaker, Standby Battery” on page 494 to remove the battery.)

Warning: Be careful not to cause a short circuit when measuring the voltage.

6. Measure the voltage of the standby battery.
   - If the voltage between red and black wire of the battery is 3.5 V dc or greater, the voltage is correct. Go to step 12 to verify standby battery operation.
   - If the voltage is less than 3.5 V dc, go to the next step.
7. Plug the AC Adapter into the computer and power on the computer.

Warning: Be careful not to cause a short circuit when measuring the voltage.

8. Measure the output voltage at the connector on the keyboard card with the battery unplugged.



Pin	Voltage (V dc)
+	+4.0
–	Ground

   - If the voltage is less than +4.0 V dc, replace the DC/DC card. If the voltage is still low, replace the system board.

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- If the voltage is more than +4.0 V dc, power-off the computer, replace the standby battery, and go to the next step.

9. Ensure that the AC Adapter is plugged into the computer; then power on the computer.
10. Charging of the standby battery starts immediately. A depleted battery needs approximately 30 minutes to be recharged to the operational voltage of +3.5 V dc.
11. Unplug the AC Adapter.
12. Verify the standby battery function by removing and installing the battery pack during suspend mode.

    Note: Removing and installing the battery pack during suspend mode should be done within one minute. If the system does not resume after a charged battery pack is installed, replace the DC/DC card.

    If replacing the DC/DC card does not resolve the problem, replace the system board.

Common Device Checkout

If a common device problem is suspected, see the appropriate power supply check in the following list:

- "Port Replicator Checkout"
- "External Display Self-Test"

Port Replicator Checkout: Use the following procedure to isolate a port replicator problem.

1. Power off the computer.
2. Remove the failing devices from the replicator.
3. Unplug the AC adapter from the replicator, if attached.
4. Remove the port replicator from the computer.
5. Reconnect the failing device directly to the computer. (If another device is already connected to the computer, remove it first.)
6. Go to the "Running the Diagnostics" on page 449 and run the diagnostics.
7. If the advanced diagnostic device test does not find an error, suspect a problem with the port replicator of the system expansion bus.
8. Power off the computer and reconnect the port replicator.
9. Power on the computer and run the following advanced diagnostic tests:
   - Serial port test with the wrap plug installed on the replicator
   - Parallel port test with the wrap plug installed on the replicator
   - FDD-2 device test on the failing device with a scratch diskette
10. If diagnostic errors appear, replace the replicator or diskette drive attachment unit.

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If the problem persists after the replacement, replace the system board.

11. If power problems appear only when the replicator is used, replace the replicator.

External Display Self-Test: If the display problem occurs only when using an external display, use the following instruction to correct the problem.

Note: Before you replace a display, check that the 95XX systems support either 63XX, 85XX, or 95XX displays to see if it is connected correctly.

If the screen is rolling, replace the external display. If that does not correct the problem, replace the FRUs in the following order until the problem goes away:

1. Video card
2. System board
3. Bus adapter (if used)

If the screen is not rolling, run the display self-test as follows:

1. Power-off the computer and display.
2. Disconnect the display signal cable.
3. Power-on the display
4. Set the contrast to its maximum position.
5. Set the brightness control to the center detent position.

Check for the following conditions:

- You should be able to vary the screen intensity by adjusting the contrast and brightness control.
- The screen should be white or light gray, with a black margin (test margin) on the screen.
- The screen is set to **CRT** or **both** by the ThinkPad Configuration program.

  Note: The location of the test margin varies with the type of display. The test margin might be on the top, bottom, or one or both sides.

If you do not see a test margin on the screen, replace the display. If there is a test margin on the screen, replace the system board.

Power Management Features

Three power management modes are provided by the computer to reduce power consumption and prolong battery power.

Standby Mode: In standby mode the following occurs:

- The LCD backlight turns off.
- The hard disk motor stops.

Events that cause the computer to enter standby mode:

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- Standby is requested by the **Fn** key (**Fn**+**F3**).
- There has been no activity **auto-standby** in the ThinkPad Configuration program.

The computer exits standby mode and resumes operation when any key is pressed.

Suspend Mode: In suspend mode, the following occurs, in addition to standby mode:

- The LCD is powered off.
- The hard disk is powered off.
- The CPU stops.

Events that cause the computer to enter suspend mode:

- Suspend mode is requested by the **Fn** key (**Fn**+**F4**).
- The LCD is closed.
- The keyboard is opened.
- The specified time has elapsed from the last operation with the keyboard, mouse, hard disk drive, parallel connector, or diskette drive; or the AC Adapter is plugged in. The time is specified by ***Suspend Timer*** in the ThinkPad Configuration program.
- The battery condition is low. The battery power indicator blinks orange.
- In the ThinkPad Configuration program, the computer can be set to “Hibernate when battery becomes low.” The default setting is suspend.
- Either the PS2 OFF or PS2 SUSpend command is set in the ThinkPad Configuration program.

Notes:

1. In the ThinkPad Configuration program, the computer can be set to “Will not suspend even if LCD is closed.”
2. In the ThinkPad Configuration program, the computer can be set to “suspend hibernate while docked.”
3. When the computer is powered with ac power and is used with one of the communication PC Cards, the computer enters *standby mode*; the PC Card and application program remain active.
4. While the computer is attached to a Dock I, the computer cannot enter suspend mode.

Events that cause the computer to resume operation from suspend mode:

- The LCD is opened.
- The keyboard is closed.
- The real time clock alarm is signaled.
- The ring indicator (RI) is signaled by a serial or PCMCIA device.
- The **Fn** key is pressed.
- An external keyboard key is pressed while the computer is operating with ac power.

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Computer also exits suspend mode when timer conditions are satisfied for entering hibernation mode.

Hibernation Mode

Note: Before using the hibernation mode, the hibernation file is needed.

In hibernation mode, the following occurs:

- The system status, RAM, VRAM, and setup data are stored on the hard disk.
- The system is powered off.

Notes:

1. In the ThinkPad Configuration program, the computer can be set to “suspend hibernate while docked.”
2. The computer cannot enter hibernation mode when:
   - It is powered with ac power and a communication PC Card is used.
   - It is attached to a Dock I.

Events that cause the computer to enter hibernation mode:

- Hibernation mode is requested by the **Fn** key (**Fn**+**F12**).
- Timer conditions are satisfied in suspend mode.
- A critically low battery condition occurs.
- The PS2 HIBernation command is set in the ThinkPad Configuration program.

The computer exits hibernation mode and resumes operation when the power-on switch is turned on.

When power is turned on, the hibernation history in the boot record on the hard disk is recognized and system status is restored from the hard disk to resume operation.

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Symptom-to-FRU Index

The symptom-to-FRU Index lists the symptoms and errors and the possible causes. The most likely cause is listed first.

Note: Perform the FRU replacement or actions in the sequence shown in the "FRU/Action" columns. If a FRU did not solve the problem, put the original part back in the computer. Do not replace a nondefective FRU.

This index can also be used to help you decide which FRUs to have available when servicing a computer.

Numeric error codes show the errors detected in POST or system operation. In the following error codes, **X** can be any number.

If no codes are available, use narrative symptoms.

If the symptom is not listed, go to "Undetermined Problems" on page 447.

> **Note:** For IBM devices not supported by diagnostic codes in the ThinkPad notebook computers, see the manual for that device.

Numeric Error Codes

Symptom / Error	FRU / Action in Sequence
10X 101: Interrupt failure. 102: Timer failure. 103: Timer interrupt failure. 104: Protected mode failure. 105: Last 8042 command not accepted. 107: NMI test failure. 108: Timer bus test failure. 109: Low meg-chip select test.	**System board**
110 (Planar parity.)	1. **Go to "Memory Checkout" on page 416.** 2. DIMM card adapter and DIMM 3. The computer is attached to the expansion unit. 4. System board

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Symptom / Error	FRU / Action in Sequence
111 (I/O parity.)	1. **Go to "Memory Checkout" on page 416.** 2. Expansion Unit or Port Replicator 3. System board
158 (HDP was not set even though the supervisor password is set.)	**Set a HDPs for the both hard disk drive in the HDD bay and the one in the UltraBay.**
159 (HDP is not set the same as the supervisor password.)	**Set a HDPs for both the hard disk drive in the HDD bay and the one in the UltraBay.**
161 (Dead battery.)	1. **Go to "Checking the Backup Battery (Nonrechargeable)" on page 426.** 2. Backup battery 3. System board
163 (Time and date were not set.)	1. **Reseat the keyboard connector on the video card.** 2. Set time and date. 3. System board
173 (Configuration data was lost.)	1. **Reseat the keyboard connector on the video card.** 2. Select OK in the error screen; then set the time and date. 3. Backup battery 4. System board
174 (Configuration error: Perform"Checking the Installed Devices List" on page 450 before changing any FRUs.)	1. **Check device configuration.** 2. System board 3. Diskette drive 4. Hard disk drive
175, 177, 178 175: EEPROM CRC #1 error. 177: Supervisor password check sum error. 178: EEPROM is not functional.	**System board**
183 (Incorrect password entered at the supervisor password prompt.)	**Have the user examine the password.**
184 (POP check sum error.)	**Reset the POP (power-on password) in Easy-Setup.**

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Symptom / Error	FRU / Action in Sequence
185 (The startup sequence is not valid. Suspect that power was off when the startup sequence was being updated.)	**Reset the startup sequence in Easy-Setup.**
186	**System board**
188 (EEPROM CRC #2 error.)	**Set the system identification using the "ThinkPad Hardware Maintenance Diskette. Version 1.30"**
190 (Depleted battery pack was installed when the power was on.)	**Go to "Checking the Battery Pack" on page 424.**
191XX (PM initialization error.)	1. **System board** 2. CPU card
195 (The configuration read from the hibernation area does not match the actual configuration.)	**Check if the configuration was changed.** For example, check if the DIMM is added or disk drive is from another computer.
196 (Read error occurred in the hibernation area of the HDD.)	1. **Run the hard disk drive test.** 2. Hard disk drive
1XX	**System board**
2XX 201: Memory data error. 202: Memory line error 00–15. 203: Memory line error 16–23. 205: Memory test failure on on-board memory. 221: ROM to RAM remap error.	1. **Go to "Memory Checkout" on page 416.** 2. DIMM or DIMM adapter 3. System board
301, 303, 304, 305, 3XX (301: Keyboard error.)	1. **Go to "Keyboard or Auxiliary Input Device Checkout" on page 418.** 2. Keyboard 3. Video card 4. External numeric keypad 5. External keyboard 6. Keyboard/mouse cable 7. System board

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Symptom / Error	FRU / Action in Sequence
601, 6XX (601: Diskette drive or controller error.)	1. **Go to "Diskette Drive Checkout" on page 420.** 2. Diskette drive 3. Diskette 4. System board
602 (Diskette read error.)	1. **Go to "Diskette Drive Checkout" on page 420.** 2. Diskette 3. Diskette drive
604 (Unacceptable ID was read from the diskette drive.)	1. **Go to "Diskette Drive Checkout" on page 420.** 2. Diskette drive 3. System board
11XX 1101: Serial_A test failure.	1. **Serial device** 2. Communication cable 3. System board
17XX 1701: Hard disk controller failure. 1780, 1790: Hard disk 0 error. 1781, 1791: Hard disk 1 error.	1. **Hard disk drive** 2. System board
24XX (2401: System board video error.)	1. **System board** 2. Video card
808X 8081: Presence test failure. (PCMCIA revision number also checked.) 8082: PCMCIA register test failure.	1. **PCMCIA slot assembly** 2. PCMCIA device 3. System board
860X (Pointing device error when TrackPoint III is disabled.) 8601: System bus error—8042 mouse interface. 8602: External mouse error. 8603: System bus or mouse error.	1. **External mouse** 2. External keyboard 3. System board

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Symptom / Error	FRU / Action in Sequence
861X (Pointing device error when TrackPoint III is disabled.) 8611: System bus error—I/F between 8042 and IPDC. 8612: TrackPoint error. 8613: System board or TrackPoint error.	1. **Reseat the keyboard connector on the video card.** 2. Reseat the TrackPoint III cable on the keyboard card. 3. Keyboard 4. External mouse 5. Video card 6. System board
I9990301 **I9990302** **I9990305** I9990301: Hard disk error. I9990302: Invalid hard disk boot record. I9990305: No bootable device.	1. **Check that the operating system is installed in the HDD. If not, install the operating system.** 2. Reseat the boot device. 3. Check the startup sequence for the correct boot device. 4. Check that the operating system has no failure and is installed correctly.
I9990303 (Bank–2 flash ROM check sum error.)	**System board**
Other codes, not in this list	**Go to "Undetermined Problems" on page 447.**

Diagnostic Error Codes

If an error is detected, the following appears:

- Large **X** on the left side of the device icon.
- Device ID (three digits)
- Error code (two digits)
- FRU code (four digits)

The device ID and error code indicate the detailed portion of the FRU that caused the error. If replacing a FRU does not correct the problem, see the device ID or error code from the previous failure. If they have changed, the cause might be because the new FRU is detective or that the FRU was incorrectly installed.

Device ID: If an error is detected by the diagnostic tests, a three-digit device ID is displayed, indicating the suspected device.

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Icon	Device ID	Suspected Device
SystemBoard	001	System board
	003	Keyboard
	007	Math coprocessor
	086	Pointing device
Memory	002	Memory
Display	050	Display
	053	
HDD-1	017	Hard disk drive
HDD-2	151	Hard disk in UltraBay
HDD-3	067	First external hard disk drive
HDD-4	052	Second external hard disk drive
FDD-1	006	External diskette drive or FDD connector of the computer
FDD-2	066	External diskette drive or FDD connector of the port replicator
PCMCIA-1	080	1. Connection of the PCMCIA slot 2. PCMCIA
PCMCIA-2	088	External PCMCIA
Parallel	009	Parallel
Serial	011, 012	Serial
DSP	113	DSP
CDROM-1	215	CD-ROM
CDROM-2	216	External CD-ROM

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Icon	Device ID	Suspected Device
Infrared	103	IR
Audio	150	Audio (ESS)

FRU Codes: If an error is detected by the diagnostic tests, a four-digit FRU code is displayed. The FRU code indicates two suspected FRUs. Replace the FRU that is indicated by the ***two leftmost digits*** first; then replace the FRU that indicated by the ***two rightmost digits.*** No FRU is assigned to code 00. If only one FRU is suspected, the other FRU code is filled with zeros. See the reference page before replacing the FRU.

FRU Code	FRU
10	System board
11	CPU card
15	ESS card
16	DSP card
17	Front IR unit
18	Rear IR unit
20	Memory (see “Memory Checkout” on page 416)
30	Reserved
32	External keyboard
33	External mouse
40	LCD assembly
42	Video card
45	External CRT
50	1. Reseat the diskette drive (FDD-1). 2. Reseat the external FDD cable on the video card. 3. Diskette drive (FDD-1)
51	1. Reseat the diskette drive (FDD-2). 2. Reseat the external FDD cable on the video card. 3. Diskette drive (FDD-2)
60	1. Reseat the hard disk drive (HDD-1). 2. Hard disk drive (HDD-1)
61	1. Reseat the hard disk drive (HDD-3). 2. Hard disk drive (HDD-3)
62	1. Reseat the hard disk drive in UltraBay (HDD-2). 2. Hard disk drive in UltraBay (HDD-2)

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FRU Code	FRU
63	1. Reseat the hard disk drive (HDD-4). 2. Hard disk drive (HDD-4)
70	PCMCIA-2 (replicator)
71	PCMCIA (UltraBay)
72	1. Reseat the PCMCIA flexible cable. 2. PCMCIA slot assembly
90	CD-ROM drive
91	External CD-ROM drive

Note: The device ID and error codes are used to indicate the detail portion of the FRU that caused the error. If replacing a FRU does not correct the problem, see the device ID or error code from the previous failure. If they have changed, the cause might be because the new FRU is defective or that the FRU was incorrectly installed.

If the problem persists after replacement of the FRUs, go to “Undetermined Problems” on page 447.

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Beep Symptoms

Symptom / Error	FRU / Action in Sequence
Continuous beeps.	**System board**
One beep and a blank, unreadable, or flashing LCD.	1. **Reseat the LCD connector**. 2. Reseat the inverter card. 3. Inverter card 4. Video card 5. LCD assembly 6. System board 7. DC/DC card
One beep, and the message "Unable to access boot source."	1. **Boot device** 2. System board
One long and two short beeps, and a blank or unreadable LCD.	1. **System board** 2. Video card 3. LCD assembly
One long beep followed by four short beeps each time the power switch is operated. (System cannot power-on due to low battery voltage.)	**Connect the AC Adapter or install a fully charged battery.**
One beep every second. (System is shutting down due to low battery voltage.)	**Connect the AC Adapter or install a fully charged battery. (Allow the system to completely shut down before changing the battery.)**
Two short beeps with error codes.	**POST error. See "Numeric Error Codes" on page 432.**
Two short beeps with blank screen.	**System board**

No Beep Symptoms

Symptom / Error	FRU / Action in Sequence
No beep, power-on indicator not on, and a blank LCD during POST.	1. **Go to "Power Systems Checkout" on page 422.** 2. System board 3. DC/DC card 4. Power sources
No beep, power-on indicator on, and a blank LCD during POST.	1. **System board** 2. DC/DC card 3. CPU card
No beep, power-on indicator on, and a blinking cursor only during POST.	1. **System board** 2. CPU card 3. DC/DC card

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Symptom / Error	FRU / Action in Sequence
No beep during POST but system runs correctly.	1. **Turn the volume up and check the speaker.** 2. Check whether the DSP card or audio (ESS) card connector is loose and reseat the connector. 3. Speaker 4. DSP card or audio (ESS) card 5. DC/DC card

LCD-Related Symptoms

Important

The LCD for the notebook computer contains over 2,359,296 thin-film transistors (TFTs). A small number of missing, discolored, or lighted dots (on all the time) is characteristic of TFT LCD technology, but excessive pixel problems can cause viewing concerns. The LCD should be replaced if the number of missing, discolored, or lighted dots in any background is 21 or more.

Symptom / Error	FRU / Action in Sequence
No beep, power-on indicator on, and a blank LCD during POST.	1. **Reseat the CPU card**. 2. DC/DC card 3. Video card 4. System board 5. LCD cable assembly
• LCD backlight not working • LCD too dark • LCD brightness cannot be adjusted (TFT)	1. **Reseat the LCD connectors.** 2. LCD assembly 3. DC/DC card 4. Cable for inverter card 5. Inverter card
• LCD screen unreadable • Characters missing pels • Screen abnormal • Wrong color displayed	1. **See important note for "LCD-Related Symptoms."** 2. Reseat all LCD connectors. 3. LCD assembly 4. System board 5. Video card
LCD has extra horizontal or vertical lines displayed.	1. **LCD cable assembly** 2. LCD assembly

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Keyboard or TrackPoint III Related Symptoms

Symptom / Error	FRU / Action in Sequence
Keyboard (one or more keys) does not work.	1. **Reseat the keyboard cable on the video card**. 2. Reseat the three keyboard cables on the keyboard card. 3. Keyboard 4. Video card 5. System board
TrackPoint III does not work.	1. **Reseat the keyboard connector on the video card**. 2. Go to "TrackPoint III Checkout" on page 419. 3. Keyboard 4. Video card 5. System board
Pointer moves automatically or does not work correctly.	**See "TrackPoint III Checkout" on page 419.**

Indicator-Related Symptoms

Symptom / Error	FRU / Action in Sequence
Indicator incorrectly remains off or on, but system runs correctly.	**1. Reseat the LCD connector on the video card.** 2. LCD cable assembly 3. Video card 4. System board

LCD Information Panel-Related Symptoms

Symptom / Error	FRU / Action in Sequence
An icon in the LCD information panel remains off or on, but the system runs correctly.	1. **Reseat the keyboard connector on the video card.** 2. Reseat the LCD information panel cable on the keyboard card. 3. Keyboard 4. Video card 5. System board

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Power-Related Symptoms

Symptom / Error	FRU / Action in Sequence
Power shuts down during operation.	1. **Go to "Power Systems Checkout" on page 422.** 2. Battery pack 3. Remove the battery pack and let it cool for 2 hours. 4. DC/DC card 5. Power sources
The system does not power off. (See "Power Shutdown Switch" on page 414.)	1. **Press the power shutdown switch.** 2. System board

Function/Audio-Related Symptoms

Symptom / Error	FRU / Action in Sequence
The system does not suspend or resume when the keyboard is opened or closed.	1. **Go to "Suspend Mode" on page 430, and check that the computer can enter suspend mode.** 2. Boot an operating system and press **Fn**+**F4**. If the computer enters suspend mode, suspect that the application program is not working properly. 3. Keyboard card 4. Video card 5. System board
The system does not suspend or resume when the LCD is closed or opened.	1. **Go to "Suspend Mode" on page 430, and check that the computer can enter suspend mode.** 2. Boot an operating system and press **Fn**+**F4**. If the computer enters suspend mode, suspect that the application program is not working properly. 3. LCD assembly 4. Video card 5. System board
Battery Fuel-Gauge does not go higher than 90%.	**Go to "Checking the Battery Pack" on page 424 and see the note.**

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Symptom / Error	FRU / Action in Sequence
Memory count (size) appears different from actual size.	**Go to "Memory Checkout" on page 416.**
System configuration does not match the installed devices.	**Go to "Checking the Installed Devices List" on page 450.**
System hangs intermittently.	**Go to "Intermittent Problems" on page 447.**

DSP-Related Symptoms

Symptom / Error	FRU / Action in Sequence
In OS/2, DOS, or Windows multimedia programs, no sound comes from the computer. (Only system beeps heard at power-on.)	1. **Reseat the DSP card.** 2. Go to "1170 DSP Card or ESS Card" on page 480 and check the DSP card. 3. Check that the device driver is installed correctly.
In OS/2, DOS, or Windows, the modem does not work.	1. **Check that the DSP Modem is active.** ***OS/2 and Windows:*** Click the **DSP Modem** icon in the ThinkPad Configuration program. ***DOS:*** Run the **MWMODEM ON** command. 2. Reseat the DAA module.

ESS-Related Symptoms

Symptom / Error	FRU / Action in Sequence
In OS/2, DOS, or Windows multimedia programs, no sound comes from the computer. (Only system beeps are heard at power-on.)	1. **Reseat the audio (ESS) card.** 2. Go to "Audio (ESS) Card Checkout (765L)" on page 419 and check the ESS card. 3. Check that the device driver is installed correctly.

Peripheral-Device-Related Symptoms

Symptom / Error	FRU / Action in Sequence
External display does not work correctly.	**See "External Display Self-Test" on page 682.**
Printer problems.	1. **Run printer self-test**. 2. Parallel port device 3. Cable 4. System board

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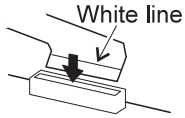
Symptom / Error	FRU / Action in Sequence
Serial or parallel port device problems.	1. **Device** 2. Device cable 3. System board
External diskette drive does not work correctly, or internal diskette drive is not recognized.	1. **Reseat the external FDD connector.** **Note:** When reseating the external FDD connector, a. Remove the connector. b. Insert the flexible cable straight until the white line aligns with the edge of the connector. c. Replace the screws of the connector. **Be careful not to damage the edge of the flexible cable when inserting it into the connector.**  2. External diskette drive 3. Make sure that the diskette is not damaged.

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Infrared-Related Symptoms

Symptom / Error	FRU / Action in Sequence
Unable to communicate using the Infrared (IR) Port.	1. **Make sure the setup for the IR is correct.** 2. Make sure there are no fluorescent lights near the computer. The computer may receive optical noise from the fluorescent light. 3. Reseat the IR unit. 4. Run the advanced diagnostic test. (see "Running the Diagnostics" on page 449) If an error occurs and a FRU code is displayed, replace the parts shown by the FRU code.

PCMCIA-Related Symptoms

Symptom / Error	FRU / Action in Sequence
PC Card does not work in either upper slot or the lower slot. Diagnostic error code: DEV 080 ERR 33 FRU 7210	1. **Reseat the PCMCIA flexible cable before replacing the PCMCIA slot.** (See "1200 PCMCIA Slot Assembly" on page 484) 2. PCMCIA slot assembly
PCMCIA slot pin is damaged.	**PCMCIA slot assembly**
CardBus card does not work.	1. **Reseat the PC Card** 2. Check the PC Card is enabled in the ThinkPad Configuration program 3. Reseat the PCMCIA flexible cable (See "1200 PCMCIA Slot Assembly" on page 484)

Other Symptoms

Symptom / Error	FRU / Action in Sequence
Errors occur only when the port replicator is used.	**See "Port Replicator Checkout" on page 428.**

Note: If you cannot find a symptom or error in this list and the problem persists, see "Undetermined Problems" on page 447.

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Intermittent Problems

Intermittent system hang problems can be caused by a variety of reasons that have nothing to do with a hardware defect, such as: cosmic radiation, electrostatic discharge, or software errors. FRU replacement should be considered only when a recurring problem exists.

When analyzing the intermittent problem, do the following:

1. Run the advanced diagnostic test for the system board in loop mode at least 10 times.
2. If no error is detected, do **not** replace any FRUs.
3. If any error is detected, replace the FRU shown by the FRU code. Rerun the test to verify that no more errors exist.

Undetermined Problems

You are here because the diagnostic tests did not identify which adapter or device failed, installed devices are incorrect, a short circuit is suspected, or the system is inoperative. Follow these procedures to isolate the failing FRU (do not replace nondefective FRUs).

Verify that all attached devices are supported.

Verify the power supply being used at the time of the failure is operating correctly. (See "Power Systems Checkout" on page 422.)

1. Power off the computer.
2. Check the cables, wires, and connectors for short/open circuits, and visually check for damage. If a problem is found, replace the FRU.
3. Remove or disconnect all of the following devices:
   a. Non-IBM devices
   b. Devices at the expansion bus connector
   c. Printer, mouse, and other external devices
   d. Battery pack
   e. Hard disk drive
   f. Diskette drive or CD-ROM drive
   g. DIMM
   h. PC Cards
4. Power on the computer.
5. Determine if the problem has changed.
6. If the problem does not reoccur, reconnect the removed devices one at a time until you find the failing FRU.
7. If the problem remains, replace the following FRUs one at a time. Do not replace a nondefective FRU.
   - DC/DC card
   - Video card
   - Keyboard card
   - LCD assembly
   - System board
   - DSP card or audio (ESS) card
   - CPU card

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Related Service Procedures

This section provides information about the following:

- “Status Indicators”
- “LCD Information Panel”
- “Running the Diagnostics” on page 449
- “Displaying the Error Log” on page 450
- “Checking the Installed Devices List” on page 450
- “Password Combinations (POP, HDP, PAP)” on page 451
- “Running a Low-Level Format” on page 451
- “Checking the PC Test Card LED” on page 451
- “Fn Key Combinations” on page 451

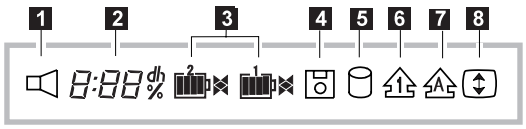
Status Indicators

The system status indicators show the current computer status in different colors (green and orange).

Symbol	Color	Meaning
	Green	Battery fully charged
	Orange	Battery charging
	Blinking orange	Battery needs charging
	Green	Computer is in suspend mode.
	Blinking green	Computer is entering suspend mode or hibernation mode, or resuming normal operation.
	Green	Power on

LCD Information Panel

The LCD information panel shows the current computer status using these icons.



Icon	Meaning
1	Speaker

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Icon	Meaning
2	Remaining battery
3 (left)	Secondary battery status
3 (right)	Main battery status
4	Diskette drive in-use
5	Hard disk in-use
6	Numeric lock
7	Caps lock
8	Scroll lock

Running the Diagnostics

Use either the TrackPoint III or the cursor move keys to interact with the tests. The **Enter** key works the same as selecting the **OK** icon to reply OK.

Note: The following tools are required:

FDD: Erasable 2HD diskette
Parallel: Wrap plug (P/N 72X8546)
Serial: Wrap plug (P/N 72X8546)
PCMCIA: PC Test Card (P/N 35G4703)
CDROM: Any CD (data CD is recommended)

1. Press and hold the **F1** key; then power on the computer. Hold the **F1** key down until the Easy-Setup screen appears.
2. Select **Test** and press Enter.
3. Select a device and press **Enter** to run the test.

   The test progress screen appears. **OK** appears when the test ends without any errors.
4. Start the **Advanced Diagnostic test** by pressing **Ctrl**+**A** on the basic diagnostic menu screen.
5. Select **Tool** to install the tools.

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6. Select a device, press the **Spacebar**, and install the tool. You can install the multiple devices by repeating this step.
   A √ mark appears beside the selected devices.
7. Select **OK** and press **Enter** if the selection is OK.
8. Select a device and press **Enter** to start the tests.
9. Select **Test All** to test all devices.
10. Select **Loop Test** to run the tests in a repeated loop. A loop option menu appears in which a device loop or all-device loop can be selected. Select a device and press the **Spacebar** to select a device. Repeat this step to select multiple devices. Press **Enter** to start the diagnostic loop. If no device is selected, all device tests are looped.
11. To exit the loop, keep pressing **Ctrl**+**Pause** until the test exits. A beep sounds to notify that the exit interrupt is sensed by the test program.

Displaying the Error Log

Diagnostic errors are printed on the printer that is attached to the parallel port when the error is detected. The error is also logged in the system memory.

Do the following to display the errors.

1. End the test, if it is running.
2. Press **Ctrl**+**A** to select the advanced diagnostic mode.
3. Press **Ctrl**+**E**.
4. The error log appears.
5. To exit the screen, select the Cancel icon or press **Esc**.

The error log is not saved when the system is powered off.

Checking the Installed Devices List

If a device is installed but the icon appears in a gray shade rather than a dark shade on the basic diagnostics screen, the device is defective. Reseat the device connectors. If the symptom remains, replace the device or the system board. If needed, adjust the contrast control to clearly distinguish the shades of the icon.

If a device that is not installed appears in a dark shade (for example, FDD-2 appears in a dark shade when *no* second FDD is installed), do the following:

1. Replace the **first** device in the configuration, such as an FDD-1.
2. If the problem remains, replace the system board.

The Parallel, and Serial icons are always displayed in a dark shade, because the icons represent subsystems of the system board and not the attachment of the devices.

The FDD-1 icon represents the **first** drive in the system configuration for each type of device. For Model 765D, FDD-1 represents an external diskette drive attached

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through the external diskette drive connector. Similarly, the FDD-2 icon represents the **second** drive, usually attached through a port replicator.

Password Combinations (POP, HDP, PAP)

When the power-on password (POP), hard disk password (HDP), and supervisor password (PAP) are used, the following situations may occur:

- ***When the POP is the same as the HDP-1 or HDP-2***

  The POP prompt appears, but one of the HDP prompts does not appear.
- ***When the POP is not the same as the HDP-1 and HDP-2***

  The POP, HDP-1, and HDP-2 prompts all appear.
- ***PAP and HDP-1 or HDP-2***

  When the PAP is used, the HDP-1 or HDP-2 is enabled automatically, but no HDP prompt appears. The HDP-1 and HDP-2 are set the same as PAP.

Running a Low-Level Format

Do the following to format the hard disk.
Warning: Make sure the drive address to be formatted is correct. This procedure erases all information on the disk.

1. Power off the computer.
2. Insert the “ThinkPad Hardware Maintenance Diskette Ver 1.30” or later into diskette drive **A** and power on the computer.
3. Select **Format the hard disk** from the main menu.
4. Select the drive from the menu.
5. Follow the instructions on the screen.

Checking the PC Test Card LED

The green LED on the PC test card turns on when the PCMCIA test is running. If the LED does not turn on, check that the card is installed correctly by reseating the card. If it still does not turn on after it is reseated, try using another slot for the test. If the LED still does not turn on and the test fails, replace the FRU shown by the diagnostic error code.

Fn Key Combinations

The following table shows the **Fn** key and function key combinations and their corresponding functions.

The **Fn** key works independently from the operating system. The operating system obtains the status through the system management interface to control the system.

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Fn +	Description
F1	Reserved
F2	Fuel-Gauge display on or off
F3	Standby mode invocation
F4	Suspend mode invocation
F5	Reserved
F6	Reserved
F7	Switching display between LCD and CRT
F8	Reserved
F9	Reserved
F10	Reserved
F11	Switching power management mode (High Performance, Automatic, and Customized)
F12	Hibernation invocation

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Product Overview (765D, 765L)

The following table shows an overview of the system features:

Feature	Description
Processor	Intel® Pentium® MMX™ 166/66 MHz, 256KB L2 Cache
Bus architecture	PCI bus
Memory (standard)	32MB (8 MB on the system board, 8 MB on the DIMM adapter card, and 16 MB as DIMM)
Memory (option)	8MB, 16MB, 32MB, and 64MB DIMM card (max. 104MB)
CMOS RAM	114 bytes + 4 kilobytes
Video	13.3-inch, 64K colors, 1024×768 pixel XGA TFT color LCD
Diskette drive (removable)	• 720KB, 1.2MB, 1.44MB, 2.88MB (4-mode), 3.5-inch • 720KB, 1.2MB, 1.44MB (3-mode), 3.5-inch
Hard disk drive (removable)	3.0GB, 2.5-inch
CD-ROM drive (**765D**) (removable)	5-inch, 8x speed, IDE interface
DSP card (**765D**)	• Audio function • Fax/modem function • Telephony function • &mwave. function
ESS card (**765L**)	Audio function
Infrared transfer	• Two IR ports • IrDA 1.0 • ASK • 1.15 million bps
PCMCIA	One Type-III or two Type-II

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FRU Removals and Replacements

This section contains information about removals and replacements.

- Do not damage any parts. Only certified, trained personnel should service the computer.
- The arrows in this section show the direction of movement to remove a FRU, or to turn a screw to release the FRU. The arrows are marked in numeric order, in square callouts, to show the correct sequence of removal.
- When other FRUs that must be removed before the failing FRU is removed, they are listed at the top of the page.
- To replace a FRU, reverse the removal procedure and follow any notes that pertain to replacement. See “Locations” on page 503 for internal cable connections and arrangement information.
- When replacing a FRU, use the correct screw size, as shown in the procedure.

Safety Notice 1: Translation on page 8

Before the computer is powered-on after FRU replacement, make sure all screws, springs, or other small parts, are in place and are not left loose inside the computer. Verify this by shaking the computer and listening for rattling sounds. Metallic parts or metal flakes can cause electrical short circuits.

Safety Notice 3: Translation on page 10

The battery pack contains small amounts of nickel. Do not disassemble it, throw it into fire or water, or short-circuit it. Dispose of the battery pack as required by local ordinances or regulations.

Safety Notice 8: Translation on page 14

Before removing any FRU, power-off the computer, unplug all power cords from electrical outlets, remove the battery pack, and then disconnect any interconnecting cables.

Safety Notice 4: Translation on page 11

The lithium battery can cause a fire, explosion, or severe burn. Do not recharge it, remove its polarized connector, disassemble it, heat it above 100°C (212°F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

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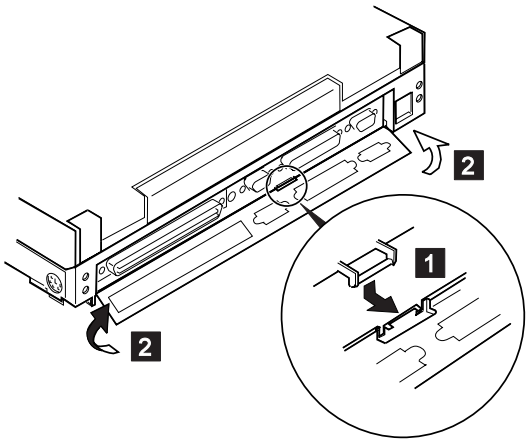
1010 Rear Connector Door

Remove the center latch 1 ; then remove the rear connector door by flexing it 2 .



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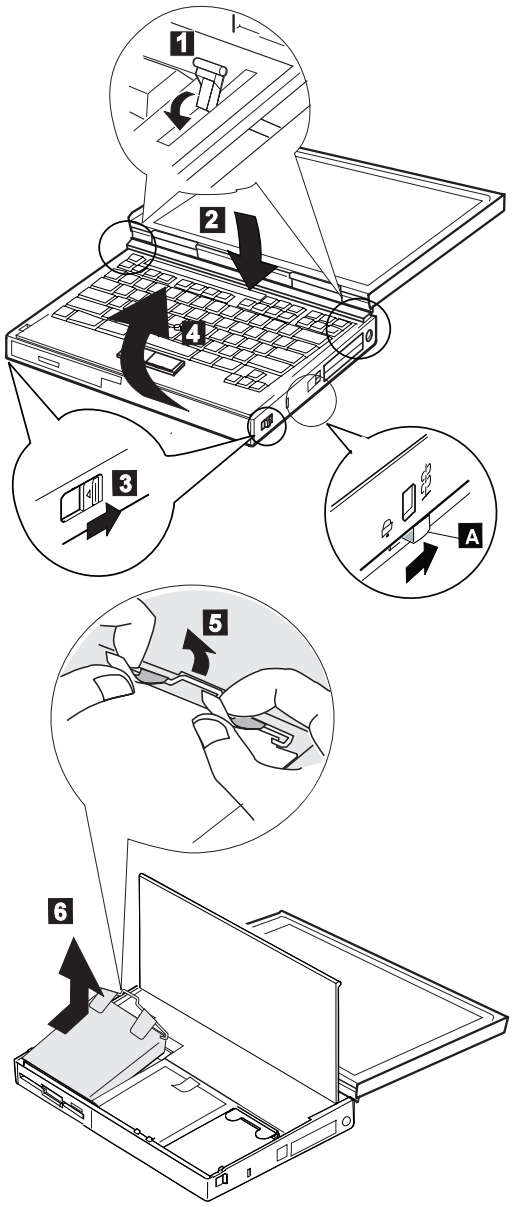
1020 Diskette Drive or CD-ROM Drive

Diskette Drive (Model 765L)

Note: If the security latch **A** is at the left position, push and slide it to the right position (unlock).



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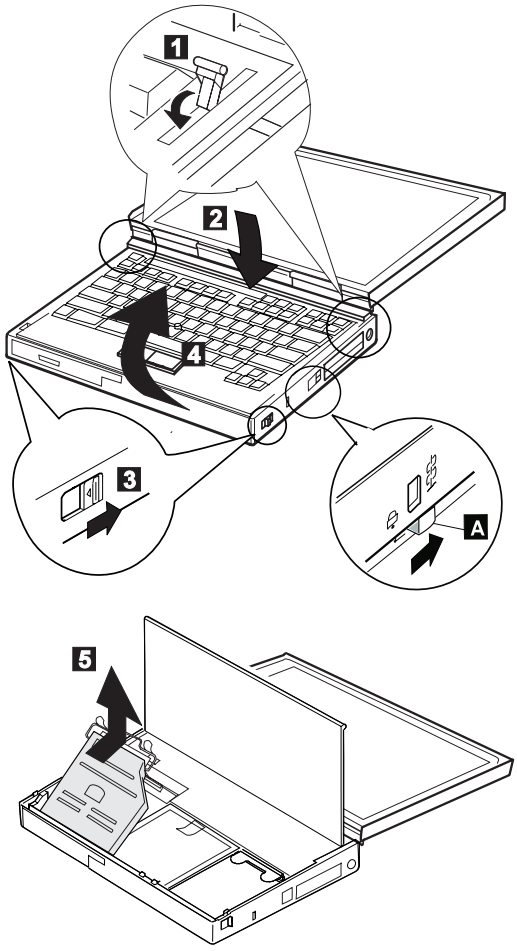
CD-ROM Drive (Model 765D)

Attention

Note: Remove the CD-ROM drive exactly as shown in the figure. Do not apply any extra force to the CD-ROM drive when removing it.

Note: If the security latch **A** is at the left position, push and slide it to the right position (unlock).



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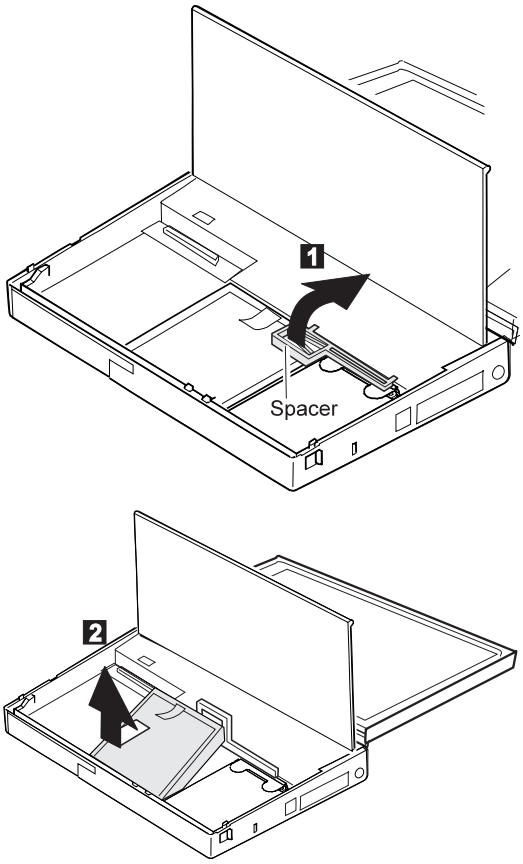
1030 Battery Pack

- CD-ROM Drive or Diskette Drive **(1020)**

Note: Be careful that the computer does not fall backward when the battery pack is removed.

If there is a spacer, open the spacer before removing the battery pack.



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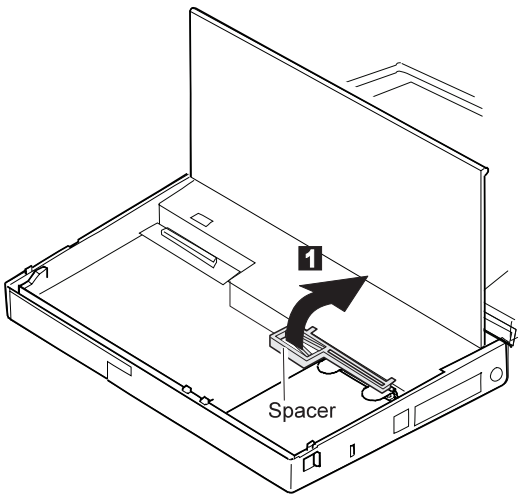
1040 Hard Disk Drive

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**

Attention

Do not drop or apply any shock to the hard disk drive. The hard disk drive is sensitive to physical shock. Incorrect handling can cause damage and permanent loss of data on the hard disk. Before removing the hard disk drive, have the user make a backup copy of all the information on the hard disk. Never remove the hard disk drive while the system is operating or is in suspend mode.

Note: Remove the hard disk drive exactly as shown in the figure. Do not apply any extra force to the hard disk drive when removing it.



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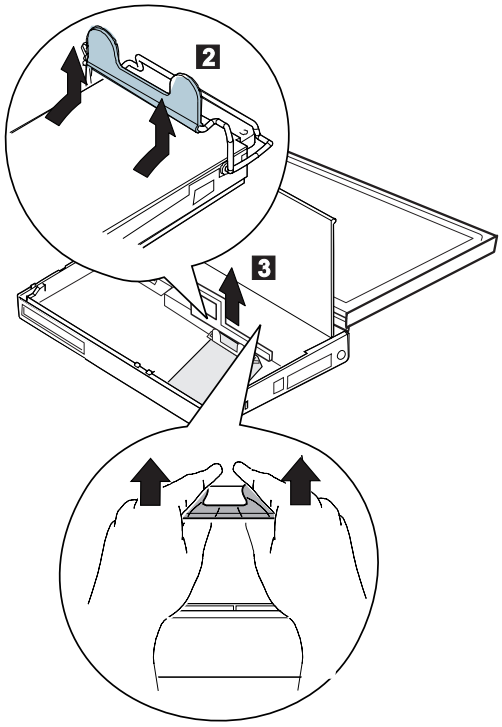

Note: After replacing the hard disk drive, latch the removal strap into the correct position.

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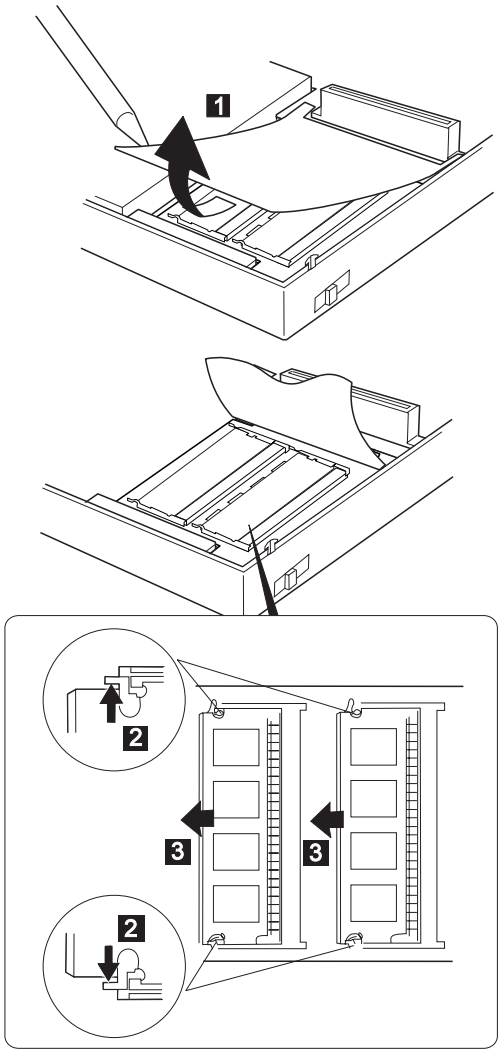
1050 DIMM (If Installed)

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**



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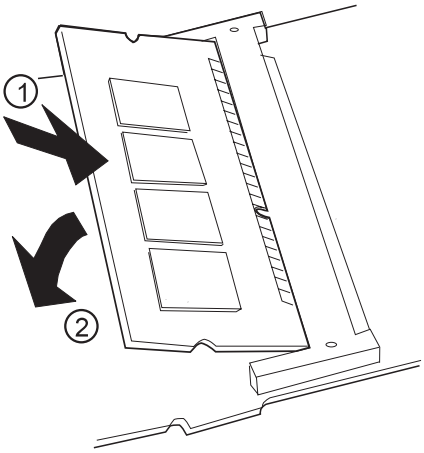
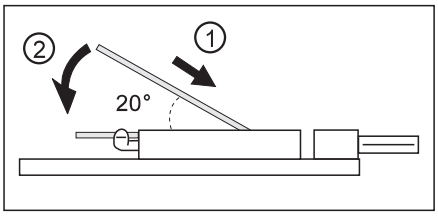
Note: When installing the DIMM, do the following:

1. Insert the DIMM, at an angle of approximately 20°, into the socket; then press it firmly.
2. Pivot the DIMM until it snaps into place.



Side View



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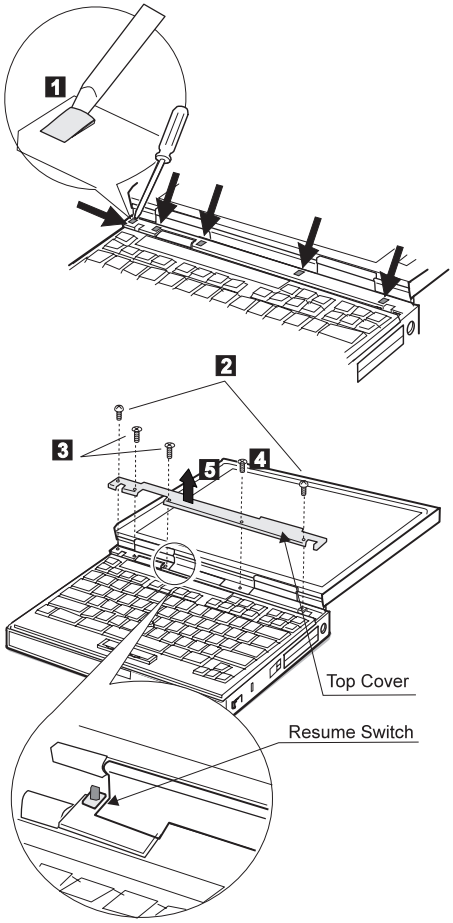
1060 Top Cover

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**

When replacing, be careful not to damage the resume switch shown in the figure.



Step	Size (quantity)	Torque
2	M2 x 6 mm, Nylon (2)	3 kgcm
3	M2.5 x 8 mm, flathead (2)	3 kgcm
4	M2.5 x 6 mm, Nylon (1)	3 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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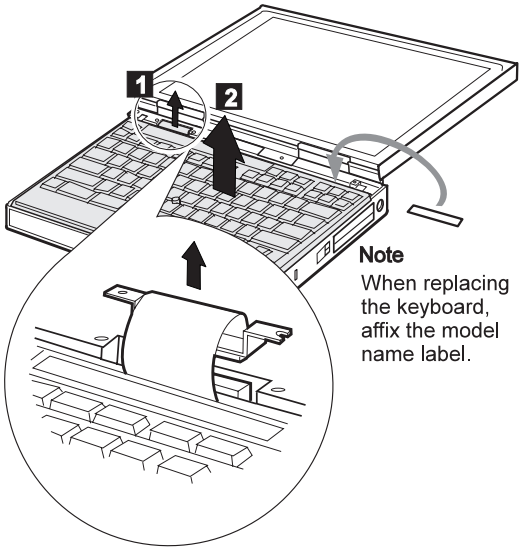
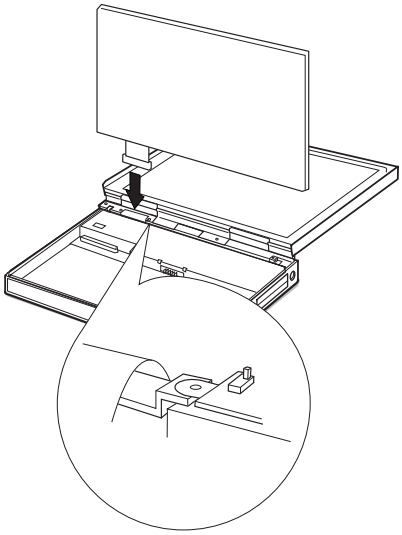
1070 Keyboard Unit

- Battery Pack **(1030)**
- Top Cover **(1060)**



When replacing:
Connect the keyboard connector as shown in the figure; then replace the keyboard.



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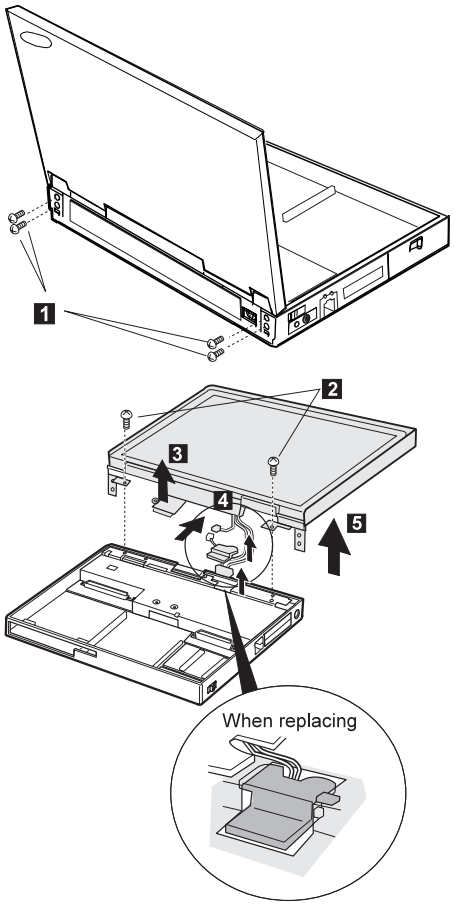
1080 LCD Unit

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**



Step	Size (quantity)	Torque
1	M2.5 x 4 mm, Nylon (4)	4.5 kgcm
2	M2.5 x 6 mm, Nylon (2)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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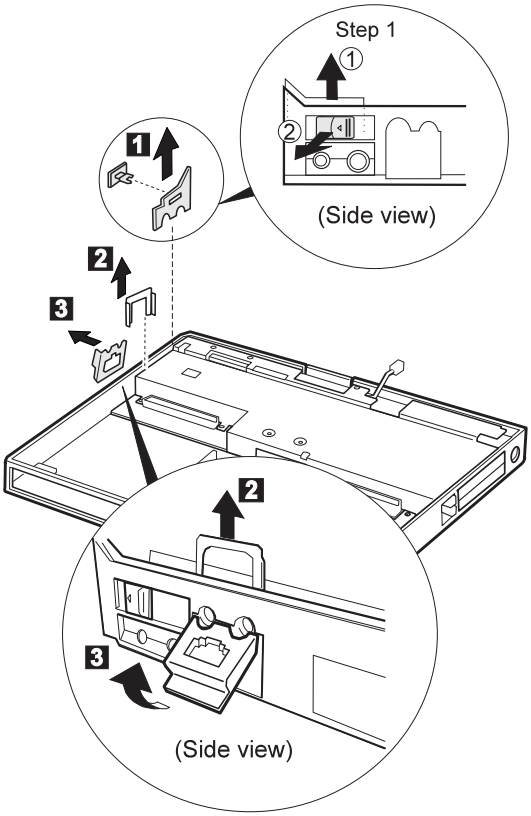
1090 Front IR

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**

Note: In step 1, lift the switch cover halfway up (①); then pull the switch lever out to remove (②).



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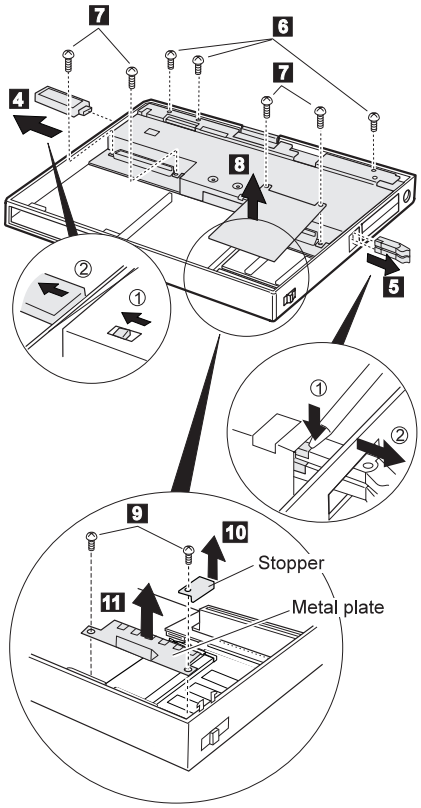
1. Step 4 is 765D-unique. For 765L, skip this step.
2. In step 5, push the levers gently to avoid flexing them.



Step	Size (quantity)	Torque
6	M2.5 x 6 mm, Nylon (3)	4 kgcm
7	M2.5 x 8 mm, Nylon (4)	4 kgcm
9	M2.5 x 4 mm, Nylon (2)	4 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

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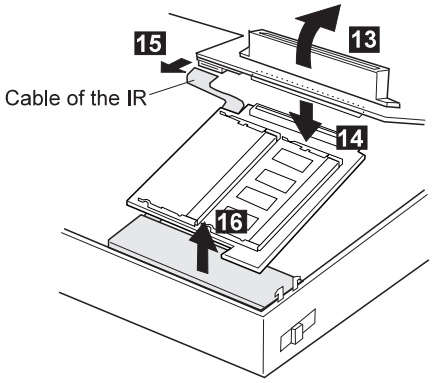
12 Move the front IR unit in its location and make it free to disconnect the DIMM adapter card connector easily.

Note: Raise the system board assembly a bit **13** to disconnect the DIMM adapter card in step **14**; then remove the DIMM adapter card. **Be careful not to damage the IR flexible cable under the DIMM adapter card.** Then remove the IR flexible cable in step **15**.



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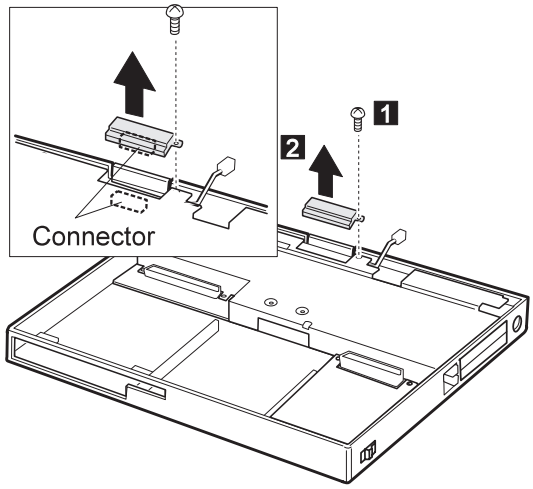
1100 Rear IR

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- LCD Unit **(1080)**



Step	Size (quantity)	Torque
1	M2.5 x 6 mm, Nylon (1)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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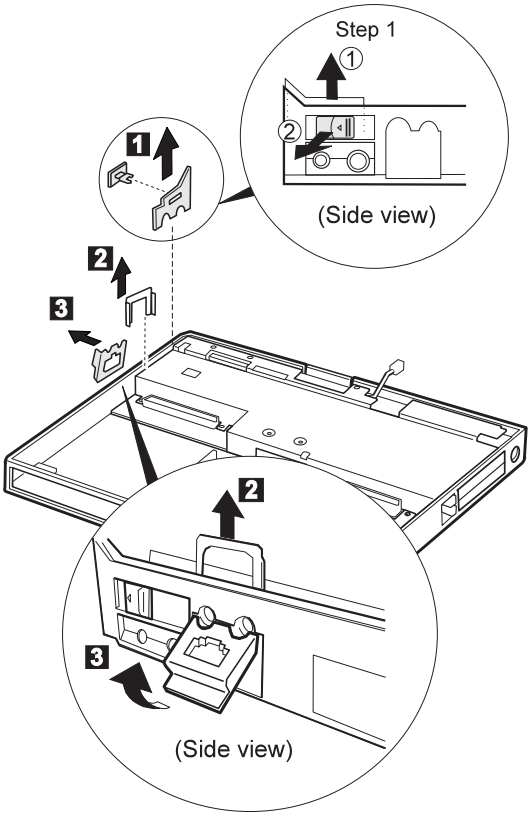
1110 System Board, DIMM Adapter Card

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- Rear IR **(1090)**

Note: In step 1, lift the switch cover halfway up (①); then pull the switch lever out to remove (②).



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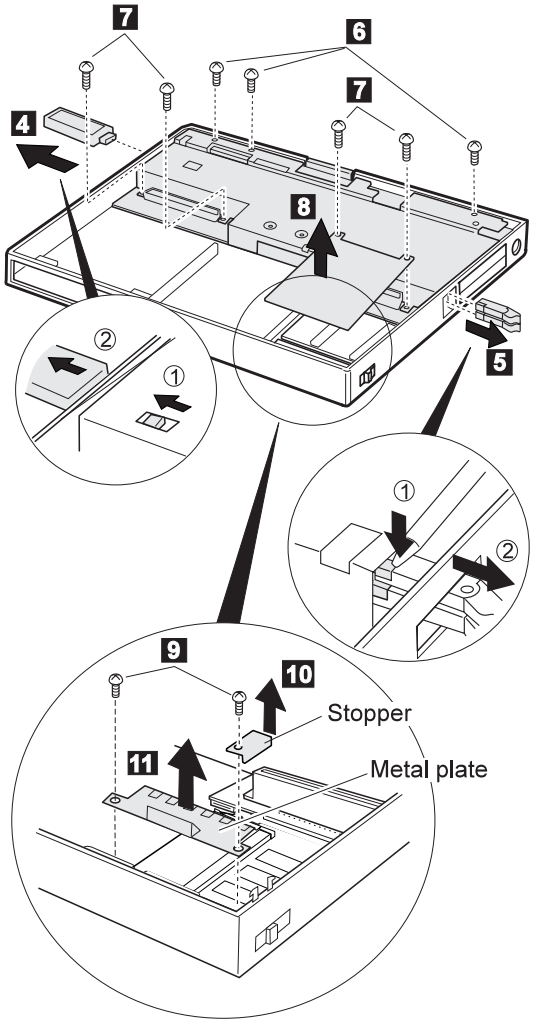
Notes:

1. Step 4 is 765D-unique. For 765L, skip this step.
2. In step 5, push the levers gently to avoid flexing them.



Step	Size (quantity)	Memo
6	M2.5 x 6 mm, Nylon (3)	4 kgcm
7	M2.5 x 8 mm, Nylon (4)	4 kgcm
9	M2.5 x 4 mm, Nylon (2)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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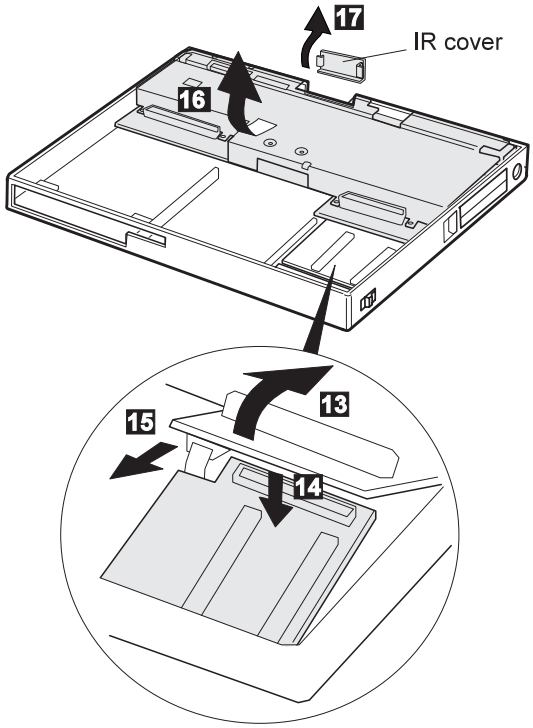
12 Move the front IR unit in its location and make it free to disconnect the DIMM adapter card connector easily.

Note: Raise the system board assembly a bit 13 to disconnect the DIMM adapter card in step 14 ; then remove the DIMM adapter. **Be careful not to damage the IR flexible cable under the DIMM adapter card.** Then remove the IR flexible cable in step 15 .



When replacing:

Make sure that the connector of the DIMM adapter card is connected firmly. Loose or wrong connection causes the memory error.

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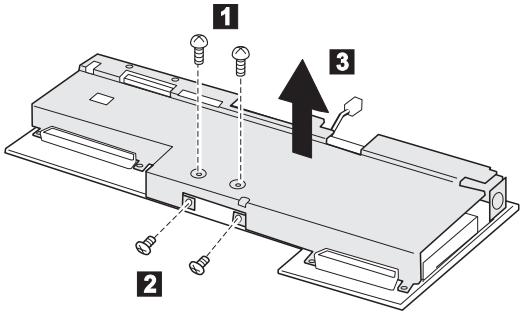
1120 Upper Shield

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- Front IR and Rear IR **(1090)**
- System Board Assembly **(1110)**



Step	Size (quantity)	Torque
1	M2.5 x 4 mm, Nylon (2)	4 kgcm
2	M2.5 x 4 mm, flathead (2)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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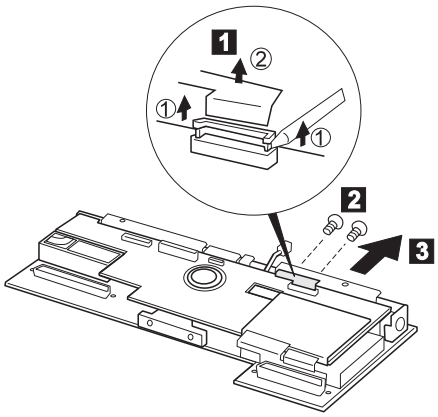
1130 External FDD Connector

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- Front IR and Rear IR **(1090)**
- System Board Assembly **(1110)**
- Upper Shield **(1120)**



When replacing:

Insert the flexible cable straight until the white line aligns with the edge of the connector.

Be careful not to damage the edge of the flexible cable when inserting it into the connector.

Step	Size (quantity)	Torque
2	M2.5 x 8 mm (2)	4 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

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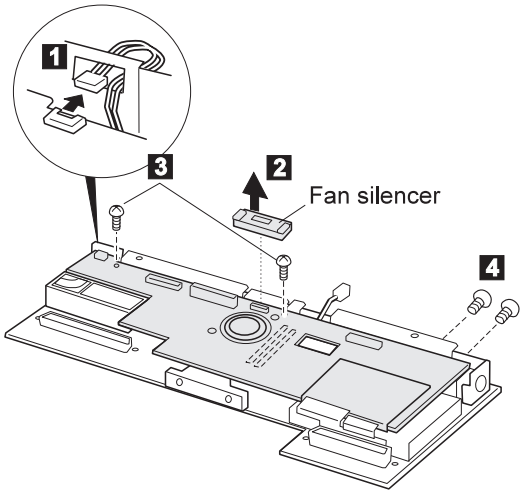
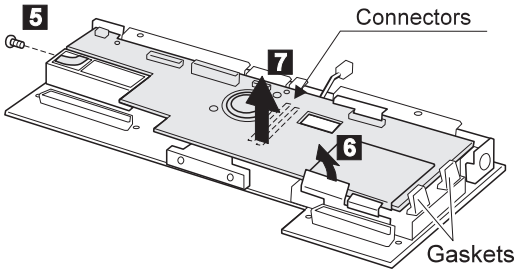
1140 Video Card

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- Front IR and Rear IR **(1090)**
- System Board Assembly **(1110)**
- Upper Shield **(1120)**
- External FDD Connector **(1130)**

Note: Steps 4 and 5 are 765D-unique.



Procedure continues on the following page.



When replacing:

Do not cover the gaskets with the video card.

For the Model 765D, remove the video cable. (See page 477)

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Step	Size (quantity)	Torque
3	M2.5 x 4 mm, Nylon (2)	4 kgcm
4	M2 x 4 mm (2)	2.5 kgcm
5	M2.6 x 5 mm (1)	3 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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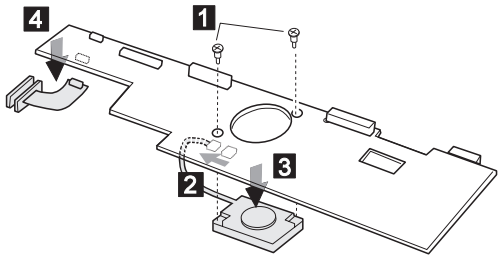
1150 Fan and Video Cable (765D-Unique)

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- Front IR and Rear IR **(1090)**
- System Board Assembly **(1110)**
- Upper Shield **(1120)**
- External FDD Connector **(1130)**
- Video Card **(1140)**

Note: Be careful not to touch the fan rotor when assembling or disassembling.

1 2 3 : Fan
4 : Video Cable (765D unique)



Step	Size (quantity)	Torque
1	Screw Fan, P/N 46H5766 (2)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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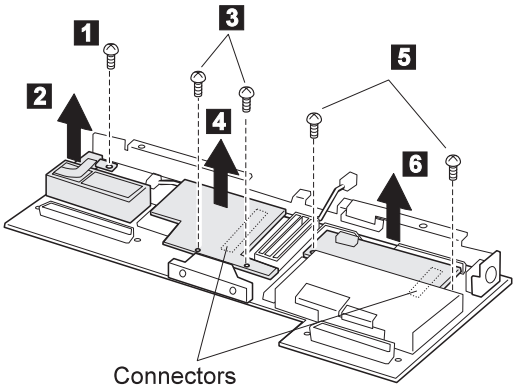
1160 Modem Holder, DC/DC Card, Inverter Card

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- Front IR and Rear IR **(1090)**
- System Board Assembly **(1110)**
- Upper Shield **(1120)**
- External FDD Connector **(1130)**
- Video Card **(1140)**

1 2 : Module Jack
3 4 : DC/DC Card
5 6 : Inverter Card



Connectors

Step	Size (quantity)	Torque
1	M2.5 x 14 mm, Nylon (1)	4 kgcm
3	M2.5 x 4 mm, Nylon (2)	4 kgcm
5	M2.5 x 6 mm, Nylon (2)	3.5 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

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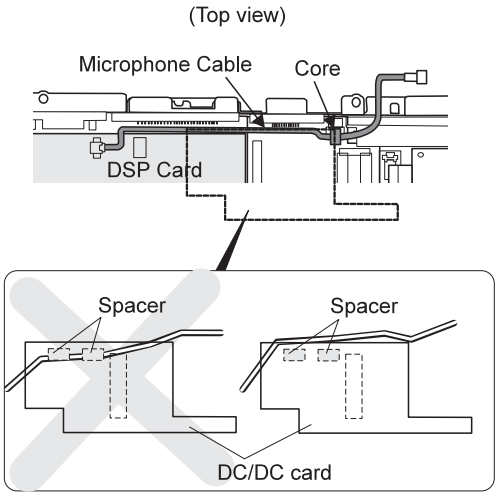
When replacing:

The following figure shows the microphone cable path.



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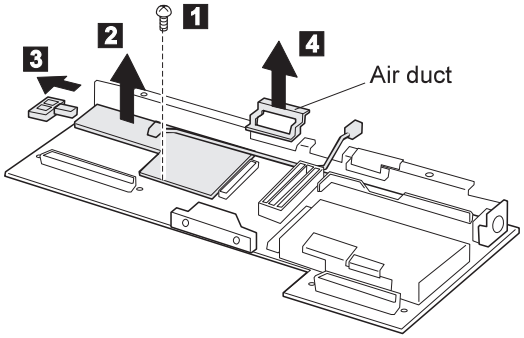
1170 DSP Card or ESS Card

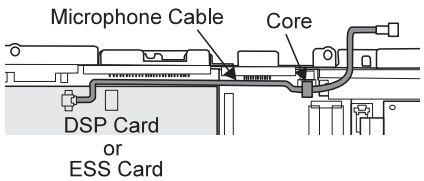
- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- Front IR and Rear IR **(1090)**
- System Board Assembly **(1110)**
- Upper Shield **(1120)**
- External FDD Connector **(1130)**
- Video Card **(1140)**
- DC/DC Card and Module Jack **(1160)**



Step	Size (quantity)	Torque
1	M2.5 x 4 mm, Nylon (1)	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

When replacing:

1. The following figure shows the microphone cable path:



2. When replacing the DSP card, make sure that the connector on the card is not loose. If the connector does not connect properly, no sound will be produced.

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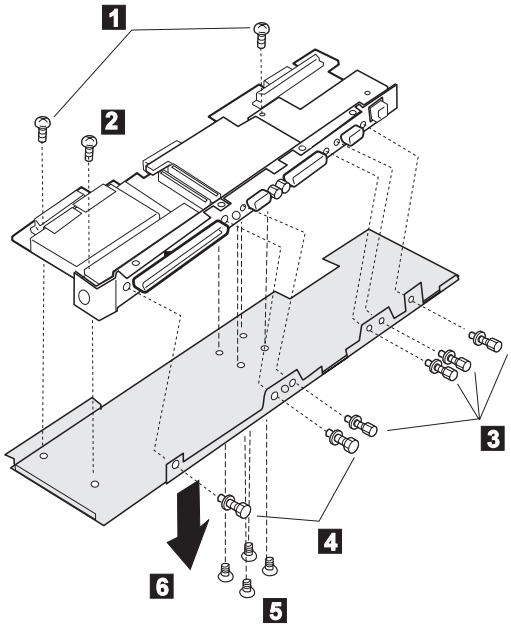
1180 Lower Shield Case

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- Front IR and Rear IR **(1090)**
- System Board Assembly **(1110)**
- Upper Shield **(1120)**
- External FDD Connector **(1130)**
- Video Card **(1140)**
- Module Jack **(1160)**



Step	Size (quantity)	Torque
1	M2.5 x 4 mm, Nylon (2)	4 kgcm
2	M2.5 x 6 mm, Nylon (1)	4 kgcm
3	5 mm, X' (4)	5.5 kgcm
4	5.5 mm, X' (2)	5.5 kgcm
5	M2.5 x 4 mm, flathead (4)	3 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

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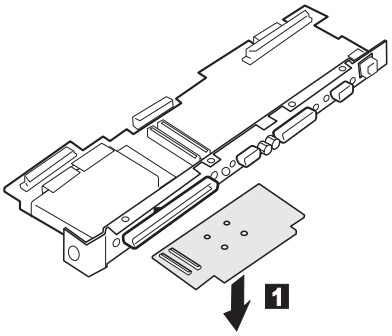
1190 CPU Card

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- Front IR and Rear IR **(1090)**
- System Board Assembly **(1110)**
- Upper Shield **(1120)**
- Video Card **(1130)**
- DC/DC Card and Module Jack **(1160)**
- DSP Card **(1170)**
- Lower Shield **(1180)**



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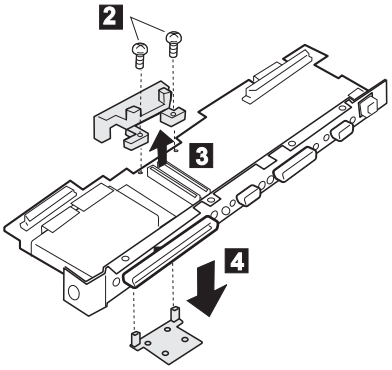
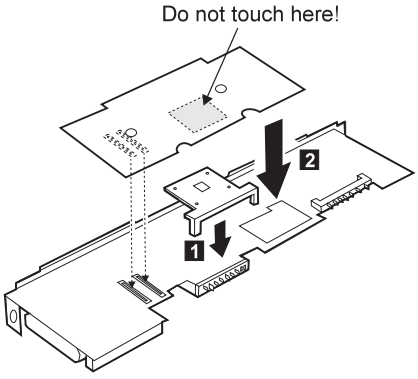


Step	Size (quantity)	Torque
7	M2.5 x 5 mm, flathead (2)	3.5 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

Attention

- Connect the CPU card using the exact procedure shown in the figures, and make sure that the two CPU card connectors are connected properly. If these connectors are not connected, you cannot power on the computer.
- **Do not touch the shaded area of the CPU card when connecting.**



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1200 PCMCIA Slot Assembly

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- Front IR and Rear IR **(1090)**
- Video Card **(1120)**
- DC/DC Card, Module Jack, and Inverter Card **(1160)**
- DSP Card **(1170)**
- Lower Shield **(1180)**

Notes:

1. The system unit serial number must be restored when the system board is replaced. To restore the system unit serial number, select the option **Set system identification** on the maintenance diskette. The EEPROM on the system board contains the vital product data (VPD): the system unit serial number, system board system number, and other computer-unique data.

   Note: Do not power off the computer while restoring the VPD.

   The system unit serial number label is attached to the base cover.
2. Before removing and replacing the system board, make sure that a PCMCIA Cards are removed and the eject levers are not sticking out.
3. Do not pull the PCMCIA slot assembly while removing the system board.
4. When handling the PCMCIA slot assembly, be careful not to disassemble any part of it. The slot assembly is not solidly fixed when it is removed from the system board or the FRU.
5. Be sure to unlock both ends of the PCMCIA connector before removing the PCMCIA slot assembly from the system board (**2**).

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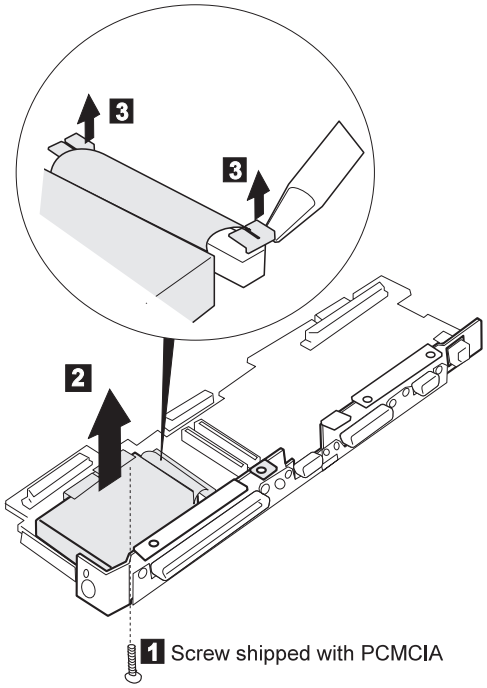
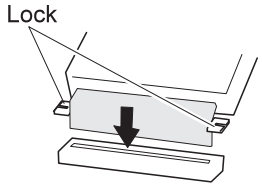


When replacing:

Move the cable lock upward to insert the cable straight. Then first insert the PCMCIA flexible cable straight and push the locks of the cable; and then replace the screws. **Incorrect connection of the PCMCIA flexible cable causes the PCMCIA error.**



Step	Size (quantity)	Torque
1	M2 x 14 mm, Nylon (1)	2.5 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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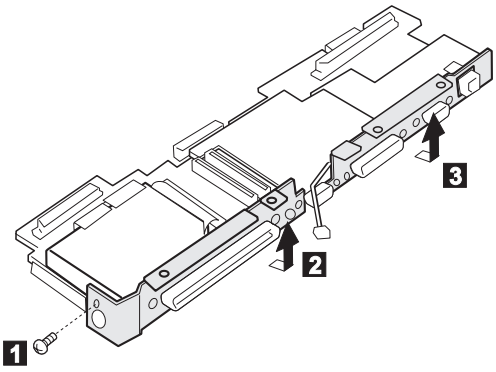
1210 Shield Cover (Right, Left)

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- Front IR and Rear IR **(1090)**
- System Board Assembly **(1110)**
- Upper Shield **(1120)**
- Video Card **(1130)**
- External Diskette Drive Connector **(1150)**
- Module Jack **(1160)**
- Lower Shield **(1180)**

1 2 : Left lower shield

3 : Right lower shield



Step	Size (quantity)	Torque
1	M2.5 x 6 mm (1)	3.5 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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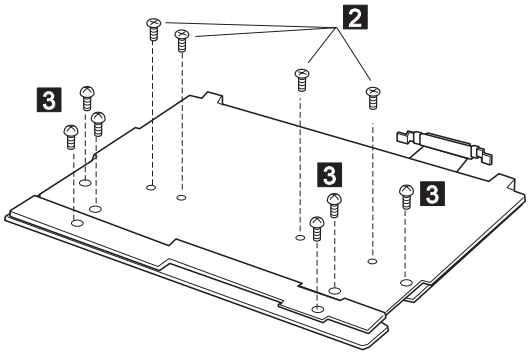
2010 Palm Rest

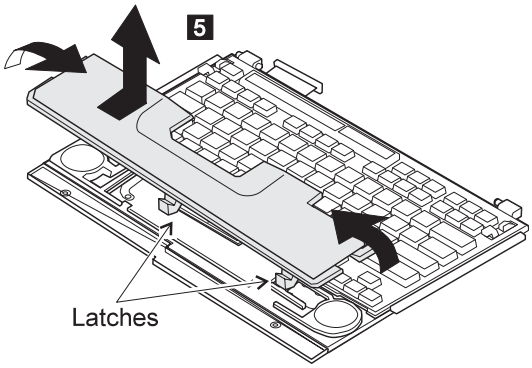
- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**

1 Turn the keyboard upside down.



Step	Size (quantity)	Torque
2	M2.5 x 5 mm, flathead (4)	3 kgcm
3	M2.5 x 4 mm (6)	3 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

4 Turn the keyboard right-side up.



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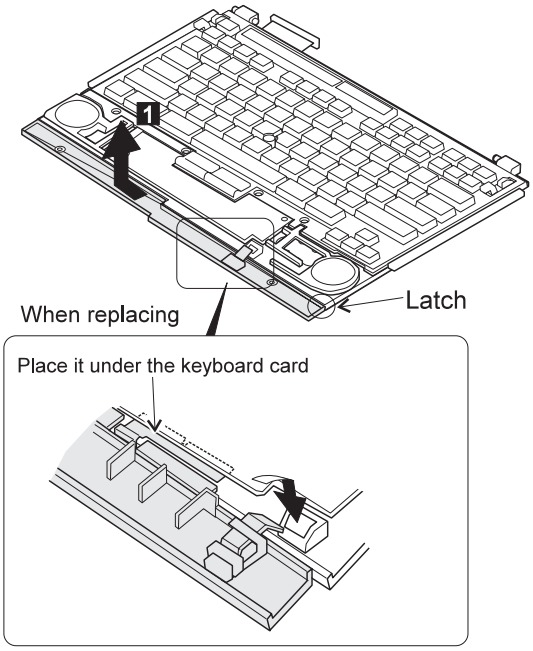
2020 Palm Rest Rear Cover

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- Palm Rest **(2010)**



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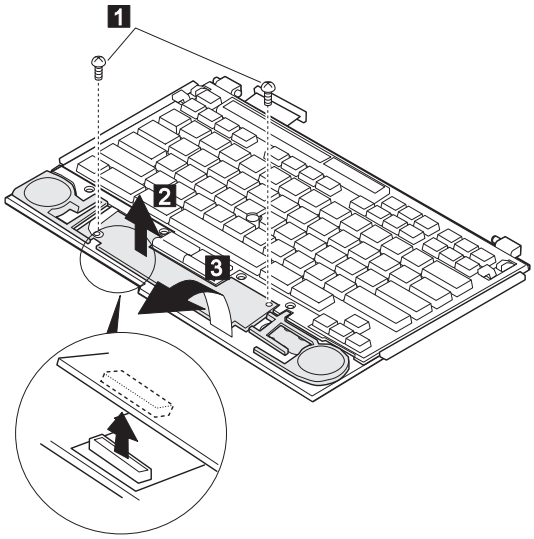
2030 Keyboard Card

- Battery Pack **(1030)**
- Diskette Drive or CD-ROM Drive **(1020)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- Palm Rest **(2010)**
- Palm Rest Rear Cover **(2020)**



Step	Size (quantity)	Torque
1	M2.5 x 4 mm (2)	3 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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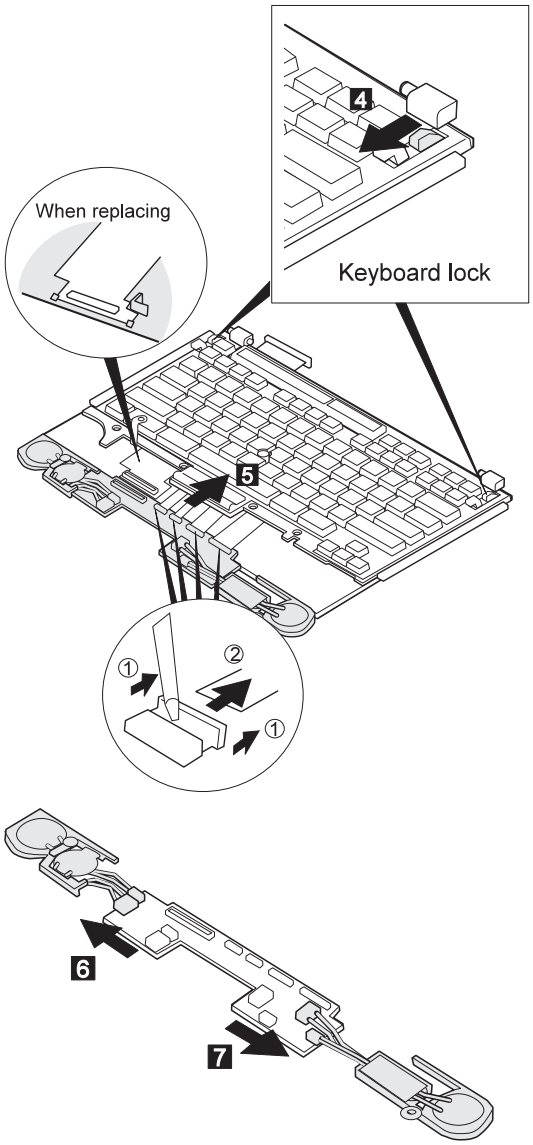
Lock the keyboard in step 4 .



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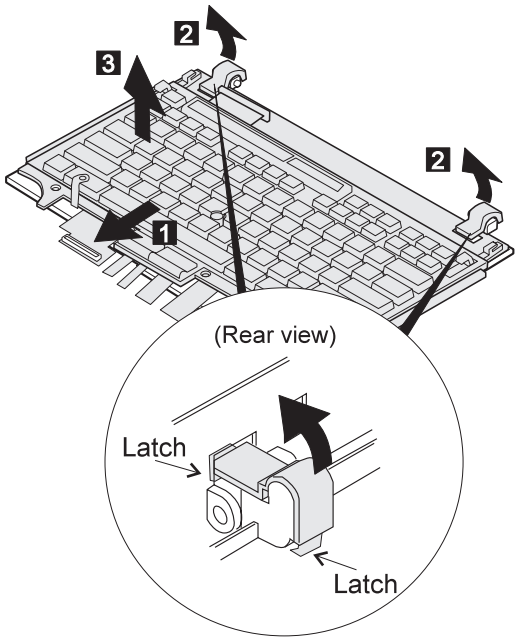
2040 Keyboard and Information Panel

- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- Keyboard Card **(1170)**
- Palm Rest **(2010)**
- Palm Rest Rear Cover **(2020)**
- Keyboard Card **(2030)**

Note: When pulling the lever off the foot **1**, separate the lower part of the lever from the foot by inserting a pointed device through the hole in the foot.



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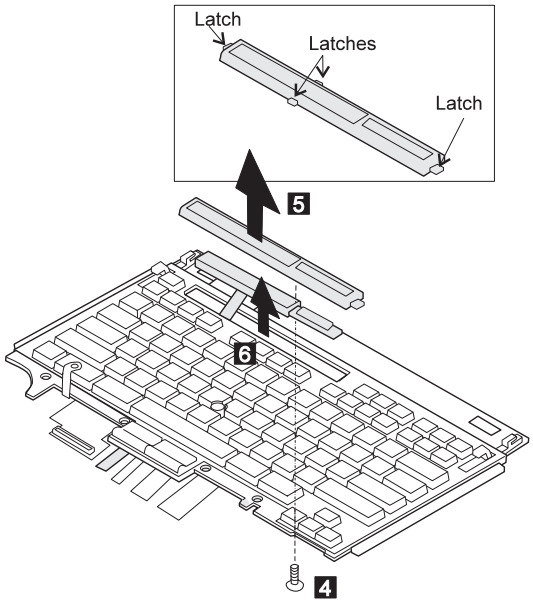

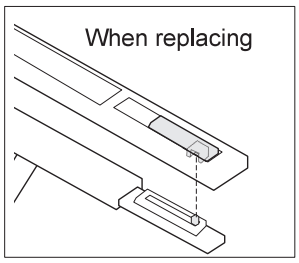

Step	Size (quantity)	Torque
4	M2.5 x 4 mm (1)	3 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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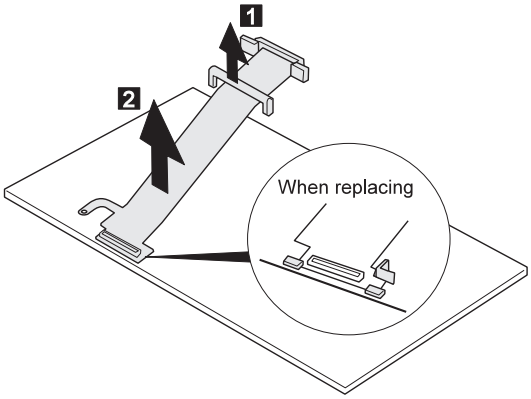
2050 Keyboard Cable

- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- Palm Rest **(2010)**
- Palm Rest Rear Cover **(2020)**
- Keyboard Card **(2030)**
- Keyboard **(2040)**

Notes:

1. When pulling the lever off the foot **1**, separate the lower part of the lever from the foot by inserting a pointed device through the hole in the foot.
2. When removing the latch from the keyboard base **1**, push both ends of the latch simultaneously.
3. When replacing the keyboard cable, place the cable correctly, as shown by the artwork in the circle.



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2060 Backup Battery, Speaker, Standby Battery

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- Palm Rest **(2010)**
- Palm Rest Rear Cover **(2020)**

Safety Notice 4: Translation on page 11

The lithium battery can cause a fire, explosion, or severe burn. Do not recharge it, remove its polarized connector, disassemble it, heat it above 100°C (212°F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

Safety Notice 2: Translation on page 9

Some standby batteries contain a small amount of nickel and cadmium. Do not disassemble it, recharge it, throw it into fire or water, or short-circuit it. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

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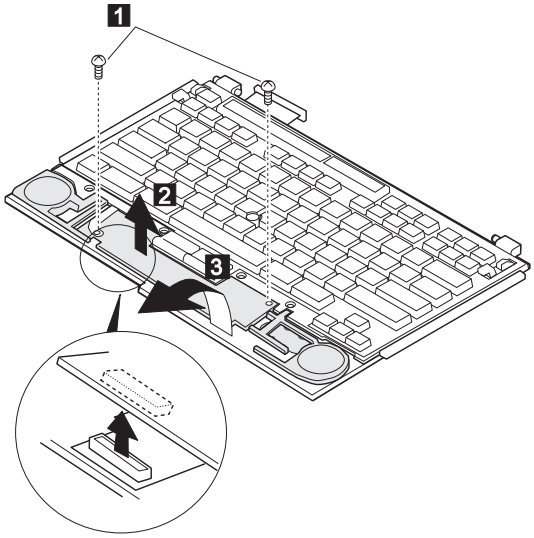

Step	Size (quantity)	Torque
1	M2.5 x 6 mm (2)	3 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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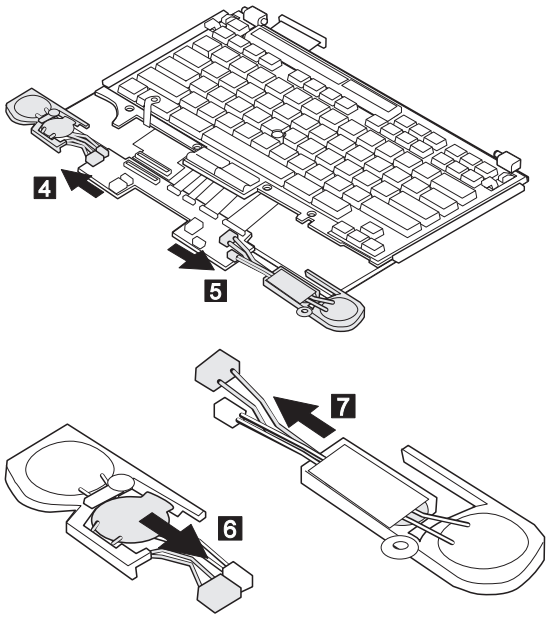
4 6 : Backup Battery
5 7 : Standby Battery
4 5 6 7 : Speaker



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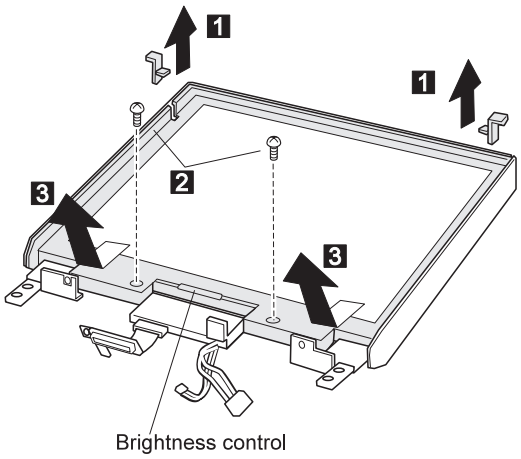
3010 LCD Front Cover

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**



Step	Size (quantity)	Torque
2	M2.5 x 6 mm (2)	3 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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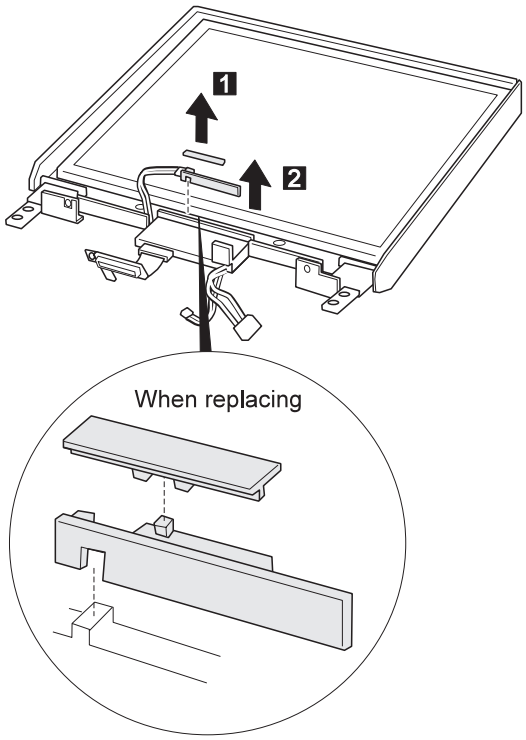
3020 LCD Misc. Parts

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- LCD Front Cover **(3010)**



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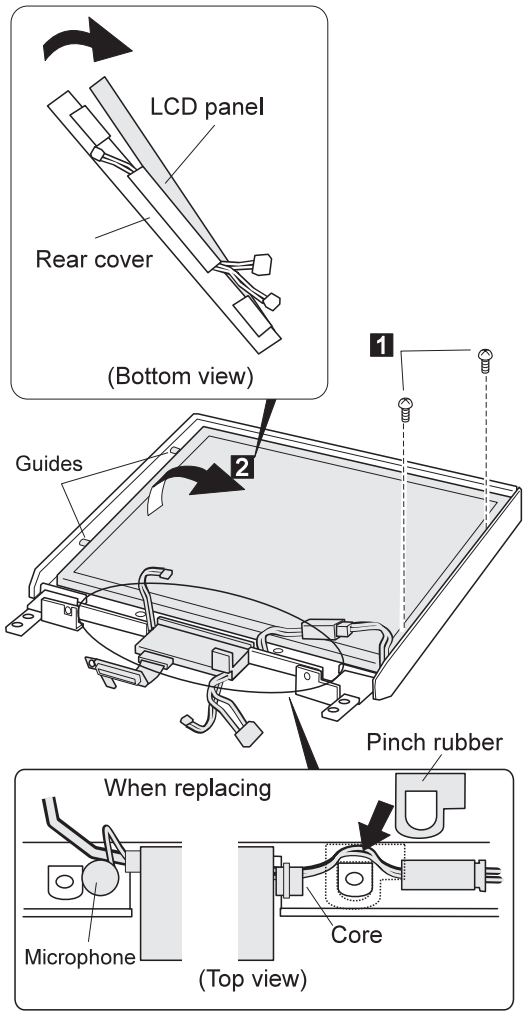
3030 LCD Panel

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- LCD Front Cover **(3010)**



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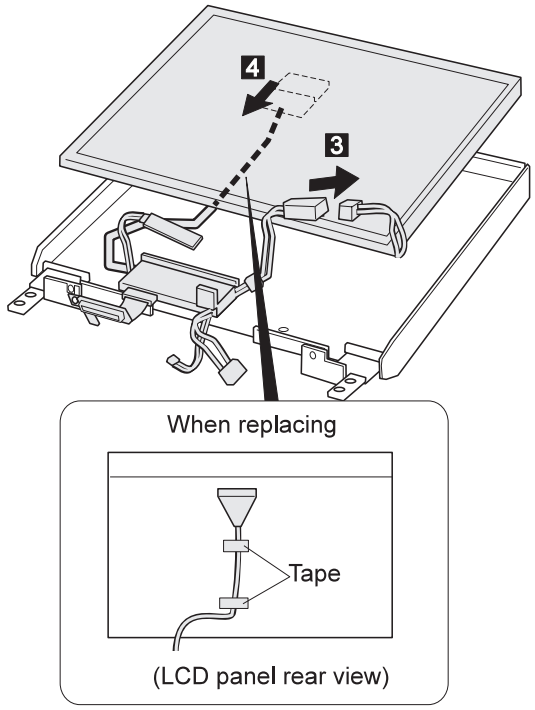
Step	Size (quantity)	Torque
1	M2.5 x 6 mm (2)	3 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		



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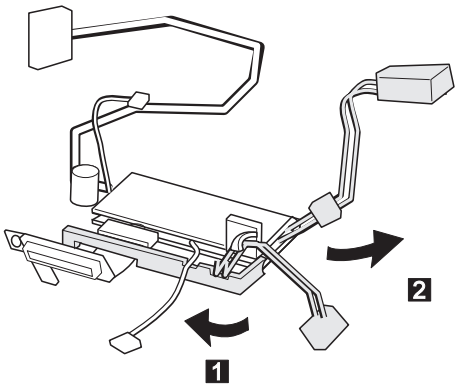
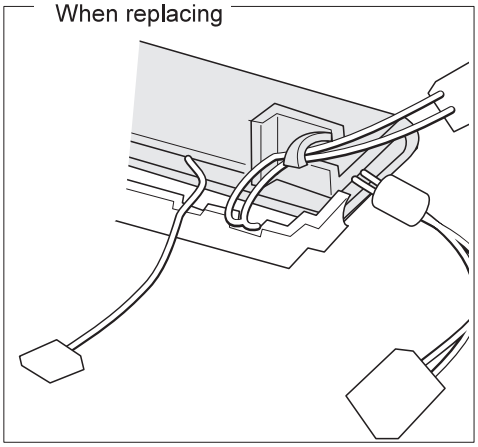
3040 Center Cover Assembly

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- LCD Front Cover **(3010)**
- LCD Panel **(3020)**





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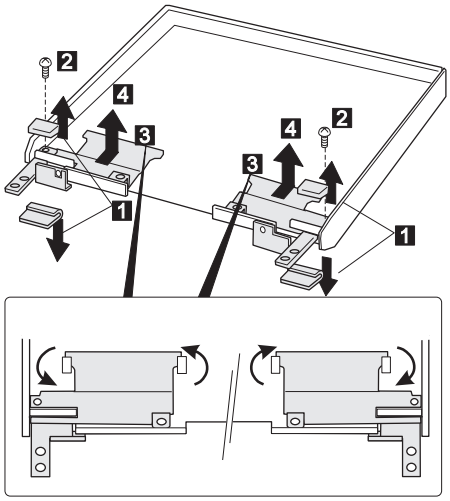
3050 Hinges

- Diskette Drive or CD-ROM Drive **(1020)**
- Battery Pack **(1030)**
- Hard Disk Drive **(1040)**
- Top Cover **(1060)**
- Keyboard Unit **(1070)**
- LCD Unit **(1080)**
- LCD Front Cover **(3010)**
- LCD Panel **(3020)**

  1 : Hinge Cover

  1 2 3 4 : Hinges



Step	Size (quantity)	Torque
2	M2 x 4 mm (2)	3 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.		

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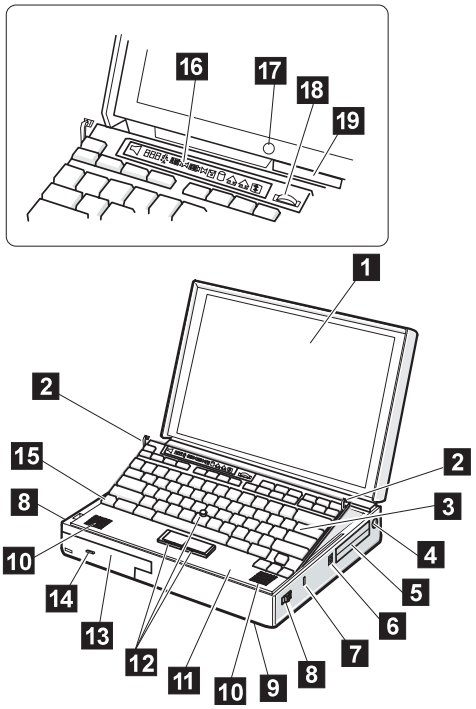
Locations

Front View

1 LCD
2 Keyboard risers
3 Auto tilt keyboard
4 External-input-device connector
5 PC Card slots
6 PC Card eject button
7 Security keyhole
8 Release latches
9 Front infrared port
10 Built-in speaker
11 Front palm rest
12 TrackPoint III
13 Removable diskette drive or CD-ROM drive (model-unique)
14 CD-ROM eject button (CD-ROM model)
15 **Fn** key
16 LCD indicator panel
17 Built-in microphone
18 Volume control
19 Brightness control



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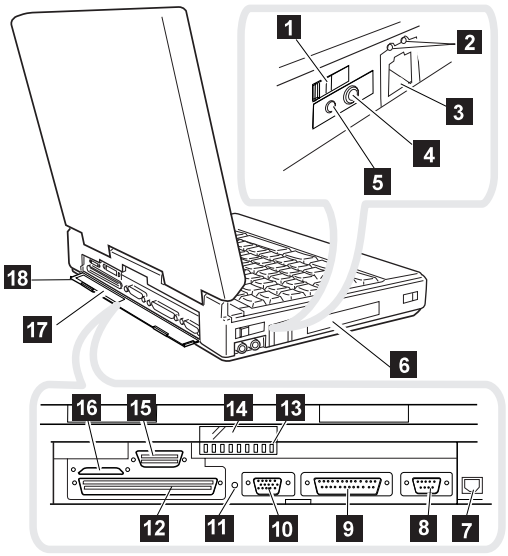
Rear View

1. Power switch
2. Video in/out ports (model-unique)
3. Modem/fax port
4. Microphone/line-in jack
5. Headphone jack
6. Option cover
7. Power jack
8. Serial connector
9. Parallel connector
10. External display connector
11. Power shutdown switch
12. System expansion connector
13. Air duct
14. Rear infrared port
15. External diskette drive connector (Model-unique)
16. MIDI/joystick port (Model-unique)
17. Connector door
18. Rear door



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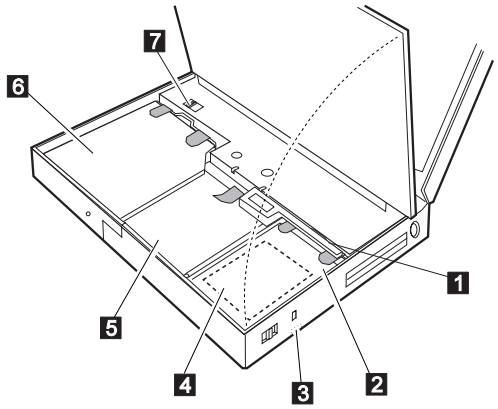
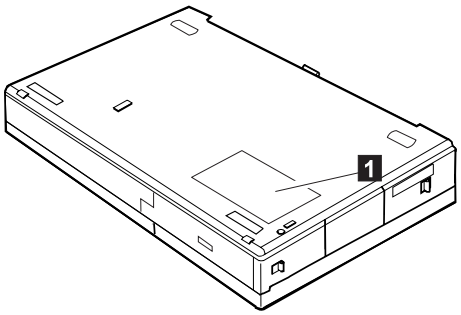
Inside View

1. Spacer (Model unique)
2. Removable hard disk drive
3. Security latch
4. Memory slot
5. Battery pack
6. UltraBay
7. Modem/fax port release latch



Bottom View

1. Serial Number



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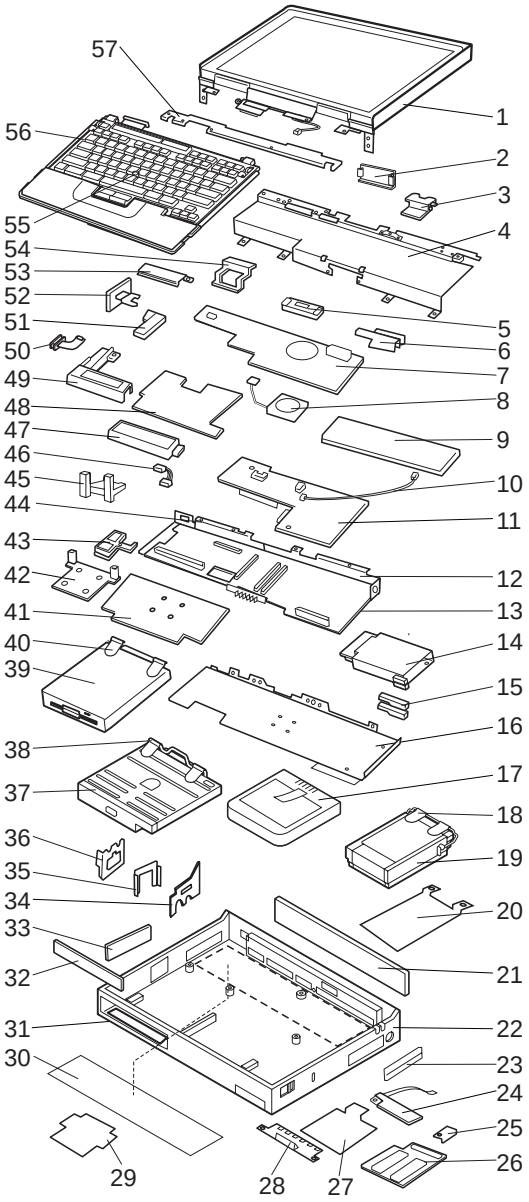
Parts Listing 765D (9546), 765L (9547)



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Index	*Part*	
1	LCD Assembly (**765D/765L**, 13.3 XGA)	11J8133
	LCD Assembly (**765L**, 13.3 XGA, NEC)	11J9654
	See "LCD FRU" on page 509 for LCD FRU.	
2	IR Cover (See Misc. Parts)	
3	Cable Protector	11J8187
4	Upper Shield Case	11J8122
5	Fan Silencer	46H5495
6	External FDD Connector	11J8137
7	Video Card (765D)	11J8119
	Simple Video Card (765L)	11J8183
8	Fan	46H5762
	Screw for Fan	46H5766
9	Inverter Card (765D/765L, 13.3 XGA)	11J8120
	Inverter Card (765L, 13.3 XGA, NEC)	05K3100
	Inverter Holder	11J8121
	Inverter Shield	11J8182
	Inverter Shield, Upper	97H3423
10	Mic. Connection Cable	29H9210
11	Audio Card (765D)	29H9205
	ESS Card (765L)	97H3388
12	Rear Shield Case (right)	97H3425
13	System Board	05K3178
14	PC Card Slots Assembly	97H3429
15	PCMCIA Eject Button	46H6028
16	Lower Shield Case	11J8115
17	Battery Pack (Li-ion)	29H9232
18	HDD Removable Strap	29H9236
19	Hard Disk Drive (3 GB)	45H8791
20	EMI Sheet	46H5497
21	Rear Connector Door	46H5764
22	Base Cover	11J8113
	For Japan	11J8114
23	PC Card Door	29H9238
24	Front IR Assembly	29H9215
25	Stopper (See Misc. Parts)	
26	DIMM Adapter Card (8 MB)	46H5768
27	EMI Plate	97H3427
28	Metal Plate (See Misc. Parts)	
29	Shield Plate-L	11J8181
30	Thermal Rubber Sheet	11J8180
31	Lower Spacer	29H9194
32	FDD Blank Bezel	29H9239
	FDD Bezel (non-CD-ROM models)	29H9196
	FDD Bezel (CD-ROM models)	83H5431
33	Option Cover	29H9193
34	AV Cover	29H9189
35	Modem Cover Lock	39H7028
36	Modem Cover	39H7030
	Blank Cover for EMEA	29H9187

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Index	*Part*	
37	CD-ROM Drive (8X, 765D)	97H3419
38	CD-ROM Removable Strap (765D)	29H9237
39	Diskette Drive (3-mode, 765L)	29H9230
	(4-mode, 765L, for Japan)	29H9372
40	Diskette Drive Removable Strap	29H9237
41	CPU Card (166 MHz, Pentium-MMX)	82H8875
42	Heat Sink	11J8116
43	See Misc. Parts	
44	Rear Shield Case (left)	97H3424
45	Heat Sink-Sub	11J8117
46	Volume Connection Cable	29H9211
47	Internal DAA Assembly (765D)	12J1571
48	DC/DC Card	46H5750
49	Modem Holder (See Misc. Parts)	
50	Video Cable (765D)	29H9206
51	Power Switch Actuator	29H9209
52	Power Switch Button	29H9192
53	Rear IR Assembly	29H9214
54	Air Duct	46H5763
55	TrackPoint Cap	84G6536
56	Keyboard Unit (See Keyboard Unit Section)	
57	Top Cover	11J8123
	DIMM Card Holder	46H5765
	AC Adapter (56W)	
	3-pin	12J2583
	2-pin	12J2585
	Keyboard Misc. Parts	39H7105
	Misc. Parts, 765D	29H9235
	Misc. Parts, 765L	46H5367
	(Includes the following:)	
	Fan Silencer	
	Stopper	
	Metal Plate	
	Modem Lever	
	DSP Holder	
	Rear IR Lens	
	Model Name Label	46H6034
	Security Plate	05K4732

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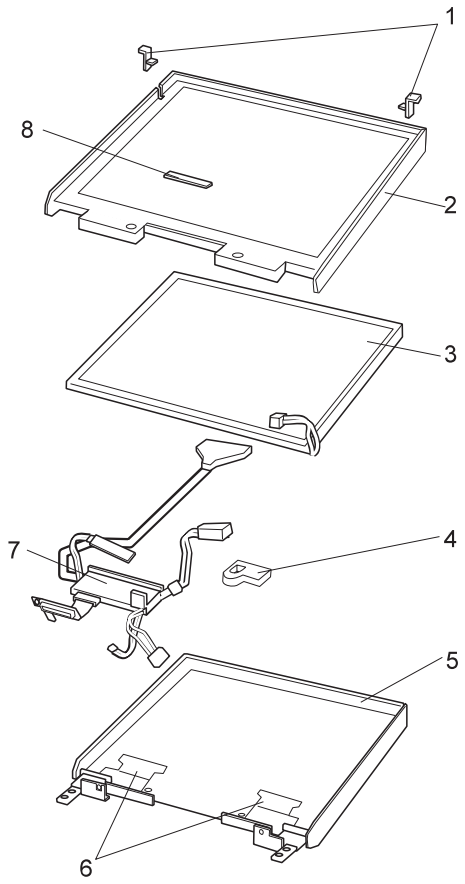
LCD FRU



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13.3 XGA, 11J8133

Index	*Part*	
1	*See LCD cover group*	
2	LCD Front Cover (See LCD cover group)	
3	LCD Panel (13.3 XGA)	11J8185
4	Pinch Rubber	11J8186
5	*See LCD cover group*	
6	Hinges	11J8135
7	LCD Cable Assembly	11J8136
8	*See LCD cover group*	

13.3 XGA, NEC 11J9654

Index	*Part*	
1	*See LCD cover group*	
2	LCD Front Cover (See LCD cover group)	
3	LCD Panel (13.3 XGA, NEC)	11J9655
4	Pinch Rubber	11J8186
5	*See LCD cover group*	
6	Hinges	11J8135
7	LCD Cable Assembly	11J9657
8	*See LCD cover group*	
	LCD cover group	11J8134
	Includes the following:	
	Rear Cover	
	LCD front cover	
	Bracket, LCD Structure	
	Gasket, long	
	Slide Knob	
	Slide Plate	
	Rail Guide, (right/left)	
	Rubber Bumper	
	Hinge Cap	
	Logo (large/small)	
	Screw Cap	
	Screw	

Note

Do not use the NEC LCD (FRU 11J9654) instead of the LCD (FRU 11J8133) and vice versa.

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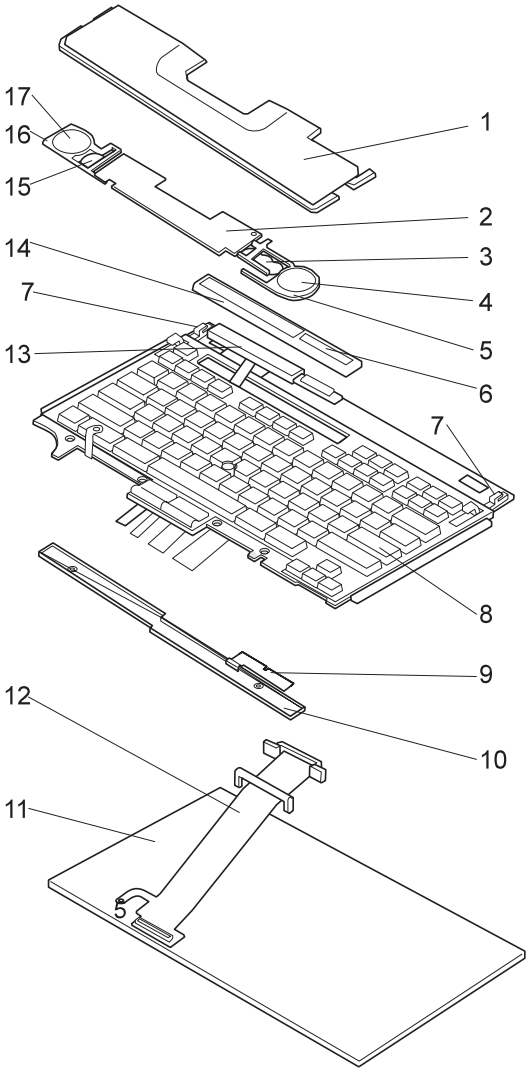
Keyboard FRU



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Index	*Part*	
1	Palm Rest	11J8131
	For Japan	11J8130
2	Keyboard Card	46H5776
3	Standby Battery	29H9225
4	Speaker (right)	29H9225
5	Speaker Holder (right)	46H5777
6	Volume Knob	39H7037
7	Keyboard Foot	39H7038
8	*See Keyboard*	
9	Keyboard EMI Plate	11J8184
10	Palm Rest Rear Cover	11J8132
11	Keyboard Base	29H9218
12	Keyboard FPC Bracket	39H7035
13	LCD Indicator Assembly	29H9220
14	LCD Indicator Assembly Cover	39H7036
	Volume Connection Cable	29H9211
15	Backup Battery	39H6983
16	Speaker Holder (left)	46H5778
17	Speaker (left)	39H6983

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Keyboard

Arabic	12J1510
Belgian	12J1508
Canadian French	12J1516
Danish	12J1507
Dutch	12J1505
French	12J1501
German	12J1499
Greek	12J1514
Hebrew	12J1511
Italian	12J1503
Japanese	12J1517
Korean	12J1520
New World Spanish	12J1515
Norwegian	12J1509
Portuguese	12J1512
Russian	12J1518
Spanish	12J1506
Swedish or Finnish	12J1504
Swiss	12J1519
Turkish	12J1513
U.K. English	12J1498
U.S. English	12J1497

Keyboard Unit

Arabic	97H3374
Belgian	11J8221
Canadian French	11J8127
Danish	11J8220
Dutch	11J8218
French	11J8215
German	11J8214
Greek	97H3378
Hebrew	97H3375
Italian	11J8216
Japanese	11J8126
Korean	97H3381
New World Spanish	11J8128
Norwegian	97H3373
Portuguese	11J8129
Russian	97H3379
Spanish	11J8219
Swedish or Finnish	11J8217
Swiss	97H3380
Turkish	97H3377
U.K. English	11J8025
U.S. English	11J8124

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Common and Option Parts List

Miscellaneous Parts

Security Parts Kit	29H9294
(Includes the following:)	
Keyboard Security Plate (760C)	
Keyboard Security Plate (760CD)	
PC Card Security Plate (760C)	
PC Card Security Plate (760CD)	
PC Card Security Stopper	
Keyboard Security Plate for Dock (760C)	
Keyboard Security Plate for Dock (760CD)	
Screw Kit	39H7003
(Includes the following:)	
M2.5 x 6 Screw (5)	
M2.5 x 4 Screw (10)	
M2.5 x 8 Screw (5)	
M2.5 Nut (10)	
Hex Stud D-Sub (5)	
Hex Stud Bus (5)	
M2.5 x 8 Flathead (5)	
M2 x 4 (5)	
Screw Cover for Top cover (5)	
M2.5 x 4 Flathead (5)	
M2.5 x 5 Flathead (5)	
Nut M2.5 (5)	
M2.6 x 5 Deform (5)	
M2.5 x 14 (5)	
M2.5 x 4 Thin Head (5)	
M1.4 x 1.8 Thin Head (5)	
M2 x 4.3 Thin Head (5)	
Nylon Screw Kit	97H3449
(Includes the following:)	
M2.5 x 4 (20)	
M2.5 x 6 (15)	
M2.5 x 8 (10)	
M2.5 x 14 (5)	
M2 x 14 (5)	
Nylon Screw Kit	
M2.5 x 4 (1000)	97H3444
M2.5 x 6 (1000)	97H3445
M2.5 x 8 (1000)	97H3446
M2.5 x 14 (500)	97H3447
M2 x 14 (500)	97H3448

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DAA Assembly

Connector for EMEA	12J1572
Austria	59G1041
Australia	59G1040
Belgium	43G3414
Denmark	59G1042
Finland	54F0715
France	4525652
Germany	77H9765
Malaysia	59G1066
Netherlands	80G3480
Norway	59G1044
New Zealand	80H3465
PRC and Hong Kong	54F0693
Sweden	54F0717
Switzerland	59G1057
Taiwan	59G1067
Thailand	59G1064
U.K.	59G1045

PSTN Cable

Austria	58G4386
Australia	58G4343
Belgium	58G4346
Denmark	58G4333
Finland	58G4334
France	58G4335
Germany	58G4347
U.S., Thailand, Malaysia, Singapore, and Hong Kong	43G3398
Netherlands	58G4340
New Zealand and PRC	58G4332
Norway	58G4334
Sweden	58G4336
Switzerland	58G4348
U.K.	58G4345

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Options

Notes:

1. When you replace the AC Adapter or the Quick Charger, use the one for the country you are in, even if the computer is from a different country.
2. The warranty for the system unit does not apply to all options.

720MB Hard Disk Drive Assembly	29H9229
810MB Hard Disk Drive Assembly	29H9366
1.08GB Hard Disk Drive Assembly	29H9367
1.2GB Hard Disk Drive Assembly	29H9228
1.4GB Hard Disk Drive Assembly	82H8884
2.1GB Hard Disk Drive Assembly	82H8489
3GB Hard Disk Drive Assembly	45H8791
Audio Cable	66G5180
Battery Pack (NiMH)	29H9233
Battery under Spacer	29H9369
Cable Travel Charger Assembly	85G1531
Car-Battery Adapter	49G1148
Conversion Cable (Game Port)	29G9269
Conversion Cable (Video)	85G1897
External Battery under Spacer	29H9369
External Diskette Drive Box Kit	66G5069
FDD (4-mode 2.88MB)	29H9372
FDD External Box Kit	66G5069
Hard Disk Drive over Pack	39H7040
Headset	85G1529
Interface Cable to System for Keyboard	84G2531
Interface Cable to Keyboard for Keypad	84G2532
Mini-DIN to Mini-DIN Cable	84G6474
Microphone	66G7871
Model Label	46H6034
Name Label	66G9228
PCMCIA Cartridge	84G1303
PCMCIA RF Cartridge	84G1304
Port Replicator	66G3575
Port Replicator with PCMCIA	66G3574
PS/2 Miniature Mouse	95F5723
Quick Charger	85G1530
Quick Charger Cable	85G1531
Second HDD Tray	29H9295
Small Car-Battery Adapter	84G4359
Travel Charger Assembly	85G1530
Wall Plug	85G2367
SO-DIMM 8 MB	42H2767
SO-DIMM 16 MB	42H2768
SO-DIMM 32 MB	42H2769
SO-DIMM 64 MB	42H2817

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Numeric Keypad

Belgian	95F5741
Canadian French	95F5466
Danish	95F5467
Dutch	95F5467
French	95F6313
German	95F6314
Greek	95F5467
Hebrew	95F5741
Icelandic	95F5467
Italian	95F6316
Japanese	79F6401
Norwegian	95F5467
Spanish	95F6315
Swedish or Finnish	95F5468
Swiss (French)	95F5711
Swiss (German)	95F5715
Turkish	95F5467
U.K. English	95F5741
U.S. English	95F5741

Black Keypad

French	84G6286
German	84G6280
Italian	84G6292
Norwegian	84G6310
Swedish	84G6304
U.K. English	84G6298
U.S. English	84G2530

Black Keyboard

French	84G6285
German	84G6279
Italian	84G6291
Norwegian	84G6309
Swedish	84G6303
U.K. English	84G6297
U.S. English	84G2529

Accessories

Keyboard/Mouse Cable	54G0444

Tools

Tri-Connector Wrap Plug	72X8546
PC Test Card	35G4703
Audio Wrap Cable	66G5180
Screwdriver Kit	95F3598
ThinkPad Hardware Maintenance Diskette Version 1.30	06J0333

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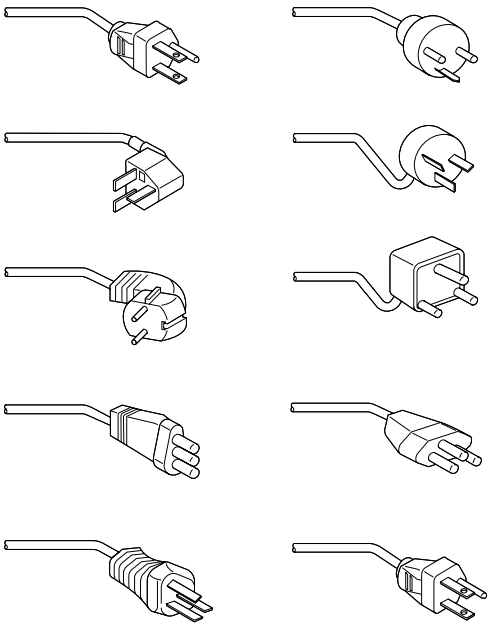
Power Cords



IBM power cords for a specific country are usually available only in that country:

- For 2-pin power cords:

IBM Power Cord Part Number	Used in These Countries
13H5264	Bahamas, Barbados, Bermuda, Bolivia, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Korea (South), Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Thailand, Trinidad (West Indies), United States of America, Venezuela
14F0033	Abu Dhabi, Albania, Antigua, Bahrain, Brunei, Dubai, Fiji, Hong Kong, India, Ireland, Kenya, Kuwait, Macao, Malaysia, Nigeria, Oman, People's Republic of China, Qatar, Singapore, United Kingdom

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IBM Power Cord Part Number	Used in These Countries
13H5270	Austria, Belgium, Bulgaria, Chile, Czech Republic, Denmark, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Israel, Italy, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Switzerland, Turkey, former Yugoslavia
13H5273	Japan
13H5276	Argentina, Australia, New Zealand, Papua New Guinea, Paraguay, Uruguay
13H5279	Bangladesh, Pakistan, South Africa, Sri Lanka

- For 3-pin power cords:

  Note: The grounded adapter is required for full MPRII compliance.

IBM Power Cord Part Number	Used in These Countries
76H3514	Argentina, Australia, Papua New Guinea, New Zealand, Paraguay, Uruguay
76H3516	Bahamas, Barbados, Bermuda, Bolivia, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Trinidad (West Indies), Thailand United States of America, Venezuela
76H3518	Austria, Belgium, Bulgaria, Czech Republic, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Turkey, former Yugoslavia
76H3520	Denmark
76H3522	Bangladesh, Pakistan, South Africa, Sri Lanka
76H3524	Abu Dhabi, Albania, Antigua, Bahrain, Brunei, Dubai, Fiji, Hong Kong, India, Ireland, Kenya, Kuwait, Macao, Malaysia, Nigeria, Oman, People's Republic of China, Qatar, Singapore, United Kingdom
76H3526	Japan

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IBM Power Cord Part Number	Used in These Countries
76H3528	Switzerland, Liechtenstein
76H3530	Chile, Italy, Ethiopia, Libya
76H3532	Israel
76H3535	Korea

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Read This First

Before you go to the checkout guide, be sure to read this section.

Important Notes

- **Only certified trained personnel should service the computer**.
- Read FRU service procedures before replacing any FRUs.
- **Be extremely careful during write operations (copying, saving, or formatting).** Drives in the computer that you are servicing might have been rearranged, or the drive startup sequence might have been altered. If you select an incorrect drive, data or programs might be overwritten.
- **Replace FRUs only for the correct model.** When you replace a FRU, make sure the model of the machine and FRU part number are correct by referring to the parts list.
- **FRUs should not be replaced because of a single, unreproducible failure.** Single failures can occur for a variety of reasons that have nothing to do with a hardware defect, such as: cosmic radiation, electrostatic discharge, or software errors. FRU replacement should be considered only when a recurring problem exists. If this is suspected, clear the error log and run the test again. Do not replace any FRUs if log errors do not reappear.
- **Be careful not to replace a nondefective FRU.**

How to Use Error Messages: Use the error codes displayed on the screen to diagnose failures. If more than one error code is displayed, begin the diagnosis with the first error code. The cause of the first error code can cause subsequent error codes to be false. If no error code is displayed, see if the error symptom is listed in the "Symptom-to-FRU Index" on page 542.

Port Replicator Problems: If you suspect a problem with the Port Replicator, see "Common Devices Checkout" on page 681.

How to Diagnose Multiple FRUs: If the adapter or device has more than one FRU, the error code could be caused by any one of them. Before replacing multiple FRUs, try removing or exchanging each FRU, one by one in the designated sequence, to see if the symptoms change.

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What to Do First: Include the following in the parts exchange form or parts return form that is attached to the returned FRU:

___ 1. Name and phone number of servicer
___ 2. Date of service
___ 3. Date when part failed
___ 4. Date of purchase
___ 5. Failure symptoms, error codes appearing on display, and beep symptoms
___ 6. Procedure index and page number in which failing FRU was detected
___ 7. Failing FRU name and part number
___ 8. Machine type, model number, BIOS level, and serial number
___ 9. Customer's name and address

Before checking problems with the computer, determine whether the damage is covered under the warranty by referring to the following:

Note for Warranty:

1. Check the ECAs (Engineering Change Announcements) of the device that pertain to the system failure before billing the customer.
2. During the warranty period, the customer may be responsible for repair costs if the computer damage was caused by misuse, accident, modification, unsuitable physical or operating environment, or improper maintenance by the customer. The following list provides some common items that are not covered under warranty and some symptoms that may indicate that the system was subjected to stresses beyond normal use:

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The following is not covered under warranty:

- LCD panel cracked from the application of excessive forces, shock, or from being dropped
- Scratched (cosmetic) parts
- Cracked or broken plastic parts, broken latches, broken pins, or broken connectors caused by excessive force
- Damage caused by liquid spilled into the system
- Damage caused by improper insertion of a PCMCIA Card or the installation of an incompatible card
- Damage caused by foreign material in the diskette drive or UltraBay II
- Diskette drive damage caused by the diskette drive cover being pressed or by the insertion of diskettes with multiple labels
- Damaged or bent diskette eject button
- CD-ROM drive damage caused by excessive force, by shock, or by being dropped
- Fuses blown by the attachment of a nonsupported device
- Forgotten computer or hard disk password (making the computer or hard disk unusable)

If the following symptoms are present, they may indicate damage caused by nonwarranted activity:

- Missing parts might be a symptom of unauthorized service or modification.
- HDD spindles can become noisy from being subjected to excessive force or from being dropped.
- I9990303 errors can be caused by exposure to strong magnetic fields.

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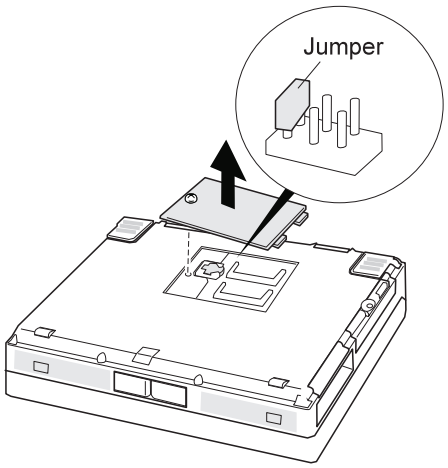
How to Disable the Power-On Password:

1. Power off the computer.
2. Remove the DIMM cover.
3. Install a jumper on the power-on-password connector as shown in the figure.



   After shorting the CE jumper, go to the appropriate step to disable the password.

If the Supervisor Password is set:

1. Power on the computer.

   The password icon appears on the upper left corner of the screen.
2. Enter the Supervisor Password; the Easy-Setup menu appears.
3. Select **Password** and **Power-On**.
4. Type the Supervisor Password on the next window; then press **Spacebar**, **Enter**, and **Enter**.

   The password is disabled.

To reactivate the password, set the password again.

When the Supervisor Password is not set:

1. Power on the computer and wait until the POST ends.
2. Verify that the password prompt does not appear.
3. After the service check is complete, remove the jumper.

To reactivate the password, set the password again.

Supervisor and Hard Disk Passwords: The supervisor password and the hard disk password (HDP) are security features that are used to protect the system and the hard disk data from unauthorized access. No overriding capability is provided. If only a hard disk password is set, obtaining permission from the password owner to unlock the password is a prerequisite for running

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diagnostic tests and performing service. If both supervisor password and hard disk password are set, you can enter Easy-Setup by pressing the **Enter** key or the power-on password at the supervisor password prompt. In this case, the **Password**, **Start up**, **Network**, and **Initialize** icons cannot be selected.

See “Password Combinations (POP, HDP, PAP)” on page 565 for more information about passwords.

Note: The supervisor password and hard disk password cannot be replaced if they are forgotten. If the customer forgets the supervisor password, the system board must be replaced. If the customer forgets the hard disk password, the hard disk drive must be replaced.

Reset Switch: The reset switch resets the system regardless of the microcode status and forces the power off. Use this push button to power-off when power is not completely off or the microcode is in a hang state.

If the computer hung, push and hold the power switch for at least 4 seconds. The computer is powered off.

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Checkout Guide

Use the following procedure as a guide for computer problems.

Note: The diagnostic tests are intended to test only IBM products. Non-IBM products, prototype cards, or modified options can give false errors and invalid system responses.

1. Obtain the failing symptoms in as much detail as possible.
2. Verify the symptoms by attempting to re-create the failure by running the diagnostic test or by repeating the same operation.

   Note: To run the diagnostics, refer to "Running the Diagnostics" on page 563.

3. Use the following table with the verified symptom to determine which page to go to. Search the symptoms column, and find the description that best matches your symptom; then go to the page shown in the "Go To" column.

Symptoms (Verified)	Go To
Power failure. (The power indicator does not go on or stay on.)	"Power Systems Checkout" on page 533.
POST does not complete. No beeps or error codes are displayed.	"Symptom-to-FRU Index" on page 542, and then go to "No Beep Symptoms" on page 551.
The configuration is not the same as the installed devices.	"Checking the Installed Devices List" on page 564.
POST beeps, but no error codes are displayed.	"Symptom-to-FRU Index" on page 542, and then go to "Beep Symptoms" on page 551.
POST detected an error and displayed numeric error codes.	"Symptom-to-FRU Index" on page 542, and then go to "Numeric Error Codes" on page 542.
The diagnostic test detected an error and displayed a FRU code.	"FRU Codes" on page 548.
Other symptoms (such as LCD display problems).	"Symptom-to-FRU Index" on page 542, and then go to "Other Symptoms" on page 560.
Symptoms cannot be re-created (intermittent problems).	"Symptom-to-FRU Index" on page 542 and then go to "Intermittent Symptoms" on page 560.

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Audio Checkout

1. Go to the diagnostic menu by selecting **Test** in the Easy-Setup menu.
2. Select **Audio** and run the diagnostic tests.
3. If the test detects a audio problem, replace the system board.

Diskette Drive Checkout

Do the following to isolate the problem to a controller, drive, or diskette. A write-enabled, blank, formatted 2HD diskette is required.

FDD-1 represents a diskette drive in the UltraBay II.
FDD-2 represents the port replicator, docking station, or diskette drive attached through the external diskette drive connector.

Attention

Make sure that the diskette does not have more than one label attached to it. Multiple labels can cause damage to the drive or cause the drive to fail.

Do the following to select the test device:

1. Click on **Test** in the Easy-Setup menu.
2. Press **Ctrl**+**A** to enter the advanced diagnostic menu.

   The ThinkPad FRU Connections window appears.
3. Click on **Exit**

   The keyboard layout screen appears.
4. Click on **Exit**.
5. Click on **FDD-1** or **FDD-2**.
6. Type **Y** (Yes) to the question on the screen. Insert the blank diskette when instructed.
7. Press **Enter** to run the diskette drive test.
8. If the controller test detects an error, FRU code 10 appears. Replace the system board.
9. If the controller test runs without errors, the drive read/write tests start automatically.
10. If the drive test detects an error, FRU code 50 for FDD-1 or 51 for FDD-2 appears. If the diskette itself is known to be good, replace the drive.
11. If FDD-2 test detects an error, move the drive into the computer's UltraBay II, if possible, and test it again as FDD-1.

    If no errors occur in the FDD-1 position, the drive is not defective. If the drive is attached to the port replicator, go to “Common Devices Checkout” on page 681 to isolate the replicator problem. Otherwise, go on to the next step.

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12. If the drive is attached through a docking station, go to the service manual of the docking station to isolate the problem.
13. If the drive is attached through an external diskette drive connector and there is not a diskette drive in the UltraBay II, reseat the external diskette drive connector. If the error persists, replace the following FRUs one at a time:
    a. External diskette drive kit
    b. Video card
    c. System board
14. If no error occurs when you test the formatted diskette, suspect the diskette that was used when the customer reported the problem.

Fan Checkout

To check the fan, listen for the fan. If it does not run, replace it. If the fan run, do the diagnostic test.

1. Start the Easy-Setup.
2. Click on **Test**.
3. Press **Ctrl**+**A** to enter the advanced diagnostic mode.

   ThinkPad Connection windows appears.
4. Click on **Exit**.

   The keyboard layout screen appears.
5. Click on **Exit**.
6. Click on **SystemBoard** then press **Enter** to run the test.

   Follow the description on the window. If the test detects the fan problem, replace it.

Game Port Checkout

Do the following if a joystick problem occurs:

1. Connect the joystick to the game port.
2. Go to the Easy-Setup menu.
3. Move to an item with the joystick.
4. Press any button of the joystick.
5. Verify that all buttons work correctly.

If either the joystick or a button does not work, replace the video card. If the problem persists, replace the system board.

Indicator Panel Checkout

If an indicator panel problem occurs, do the following:

1. Power off the computer.
2. Power on the computer. All the icons in the indicator panel should appear for a moment soon after the computer is powered on.
3. Verify that all icons appear correctly.

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If some of the icons do not appear, replace the indicator panel. If the problem persists, replace the DC/DC card.

Keyboard or Auxiliary Input Device Checkout

Remove any external keyboard before testing the built-in keyboard.

If the keyboard does not work or an unexpected character appears, make sure that the flexible cable extending from the keyboard is correctly seated in the connector on the video card.

If the keyboard cable connection is correct, check the video card.

If the tests do not detect a keyboard problem, run the **keyboard test** by doing the following:

1. Go to the diagnostic menu by selecting **Test** in the Easy-Setup menu.
2. Press **Ctrl**+**A** to enter to the advanced diagnostic mode.

   the ThinkPad FRU Connections window appears. (If the **Ctrl**+**A** does not work, triple-click on the icon on the right bottom corner on the basic diagnostic screen.)
3. Make sure that the keyboard connection is **Connected**; then press **Esc** to escape the screen.
4. Press **Esc**.

   A layout of the keyboard appears on the screen.
5. Check that when each key is pressed, the key's position on the keyboard layout on the screen changes to a black square.

   Note: When the **Fn** key is pressed, a black square briefly appears.
6. Press **Ctrl**+**Pause** to end the test.

If the tests detect a keyboard problem, do the following one at a time to correct the problem. Do not replace a nondefective FRU.

- Reseat the keyboard cables.
- Replace the video card.
- Replace the system board.

Auxiliary Input Devices: The following auxiliary input devices are supported for this computer:

- Numeric keypad
- Mouse (PS/2 compatible)
- External keyboard (with keyboard/mouse cable)

If any of these devices do not work, reseat the cable connector and repeat the failing operation.

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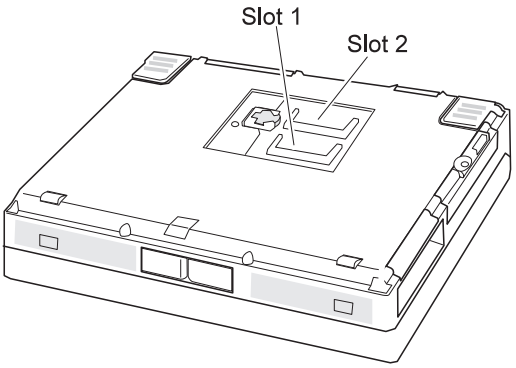
If the problem does not recur, recheck the connector.

If the problem is not corrected, replace the device, and then the system board.

Memory Checkout

DIMMs are available for increasing memory capacity.

You can install a 64-MB 2-bank DIMM in slot 1. If you try to install it in slot 2, it will not be recognized as a 64-MB DIMM.



Total (MB)	Displayed (KB)		Total (MB)	Displayed (KB)
32	32192		104	105920
40	40384		112	114112
48	48576		128	130496
64	64960		168	171456
72	73152		176	179648
80	81344		192	196032
96	97728		256	261568

Memory errors might stop system operations, show error messages on the screen, or hang the system.

Use the following procedure to isolate memory problems:

1. Power off the computer and remove any installed DIMM from its slots.
2. Press and hold the **F1** key; then power on the computer. Hold the **F1** key down until the Easy-Setup menu appears.
3. Select **Test** and press **Enter**.
4. Select **Memory** and press **Enter** to run the memory test on base memory. If an error appears, replace the system board.
5. Power off the computer and reinstall the DIMM; then power on the computer. Verify the memory size; then test the memory. If an error appears, replace the DIMM.

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If memory problems occur intermittently, use the loop option to repeat the test. When the test detects an error, an error log is printed on the printer connected to the parallel port. See “Displaying the Error Log” on page 564 for more information.

Flash Memory Update: System setup programs and diagnostic tests are stored in flash memory. A flash memory update is required for the following conditions:

- New versions of system programs
- New features or options

To update the flash memory, do the following:

1. Get the appropriate diskette containing the update.
2. Insert the System Program Service diskette into drive A, and power on the computer with ac power and a fully charged battery.
3. Select **Update system programs** from the menu.

Modem (DSP) Checkout

1. Go to the diagnostic menu by selecting **Test** in the Easy-Setup menu.
2. Select **DSP** and run the diagnostic tests.
3. If the test detects a DSP problem, replace the modem card.

Power Systems Checkout

To determine whether a power systems problem is due to the AC Adapter or the battery pack, do the following:

1. Remove the battery pack.
2. Connect the AC Adapter and check that power is supplied.
3. Disconnect the AC Adapter and install the charged battery pack; then check that power is supplied by the battery pack.

- If the problem is due to the AC Adapter, go to “Checking the AC Adapter”
- If the problem is due to the battery pack, go to “Checking the Battery Pack” on page 534

If the problem is not due to the AC Adapter or battery pack, go to the following sections:

- “Checking the Backup Battery (Nonrechargeable)” on page 536
- “Checking the Standby Battery (Rechargeable)” on page 537

Checking the AC Adapter: You are here because the computer fails only when the AC Adapter is used.

- If the power problem occurs only when AC Adapter is used with a port replicator, replace the replicator.

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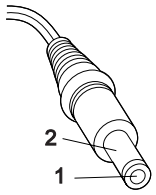
- If the power-on indicator does not turn on, check the power cord of the AC Adapter for correct continuity and installation.

1. Unplug the AC Adapter cable from the computer and measure the output voltage at the plug of the AC Adapter cable. See the following figure:



Pin	Voltage (V dc)
1	+15.5 to +17.0
2	Ground

   - If the voltage is correct, make sure the connection between DC/DC card and system board is not loose.
   - Replace the DC/DC card.
   - If the problem is not corrected, replace the system board.
   - If the problem persists, go to “Undetermined Problems” on page 561.
   - If the voltage persists, go to the next step.
2. Unplug the AC Adapter cable from the ac power outlet and wait 5 minutes or longer to allow the overvoltage protection circuit to be fully discharged and initialized.
3. Plug the AC Adapter cable into the ac power outlet.
4. Measure the output voltage of the AC Adapter.
5. If the voltage is still not correct, replace the AC Adapter.

Note: An audible noise from the AC Adapter does not always indicate a defect.

Checking the Battery Pack: If the battery pack has a problem, do the following:

1. Power off the computer.
2. Remove the battery pack and measure the voltage between battery terminals 1 (+) and 4 (–). See the following figure:

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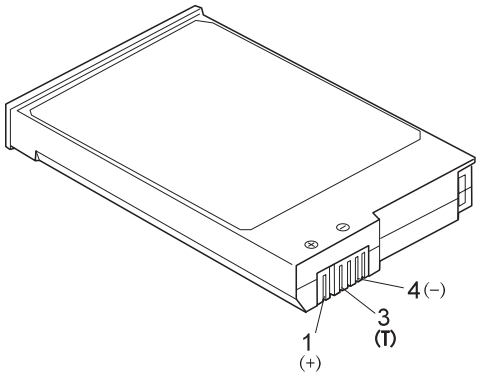

Terminal	Voltage (V dc) / Signal
1	**+0 to +13.5**
2	Send
3	**Thermal**
4	**Ground (–)**
5	Select

Note: Signal lines not used in these steps are used for communication between the system and the battery.

3. If the voltage is less than +11.0 V dc, the battery pack has been discharged. Recharge the battery pack.

   If the voltage is still less than +11.0 V dc after recharging, replace the battery.

   Note: If the voltage of the battery pack is 0 V, it is defective.

4. If the voltage is more than +11.0 V dc, measure the resistance between battery terminals 3 and 4. The resistance must be 4 to 30 K ohm.

   If the resistance is not correct, replace the battery pack.

   If the resistance is correct, replace the DC/DC card.

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Checking Operational Charging

Note.

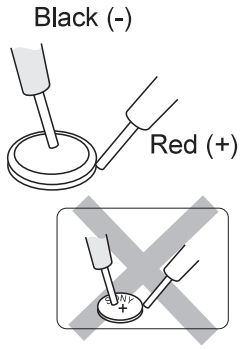
Battery charging will not start until the Fuel-Gauge shows that less than 95% of the total power remains; with this condition the battery pack will charge to 100% of its capacity. This restriction protects the battery pack from being overcharged or from having a shortened life.

To check operational charging, use a discharged battery pack or a battery pack that has less than 50% of the total power remaining when installed in the computer.

Power on the computer while it is connected to the AC Adapter. If the battery status indicator does not turn on, power off the computer, remove the battery pack and let the battery pack return to room temperature. Reinstall the battery pack, and power on the computer (still connected to the AC Adapter). If the charge indicator still does not turn on, the battery pack should be replaced.

Checking the Backup Battery (Nonrechargeable)

1. Power off the computer and unplug the AC Adapter from the computer.
2. Open the DIMM cover.
3. Remove the backup battery. (Refer to “1050 Backup Battery or DIMM” on page 574 to remove the battery.)
4. Measure the voltage of the backup battery connector. See the following figure:



Wire	Voltage (V dc)
Red	+2.5 to +3.7
Black	Ground

- If the voltage is correct, replace the system board.

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- If the voltage is not correct, the backup battery has been discharged. Replace the backup battery.
- If the backup battery discharges quickly after replacement, replace the system board.

Checking the Standby Battery (Rechargeable)

1. Power off the computer and unplug the AC Adapter from the computer.
2. Remove the battery pack and keyboard.
3. Remove the standby battery. (Refer to “1100 Standby Battery” on page 586 to remove the battery.)

   Attention

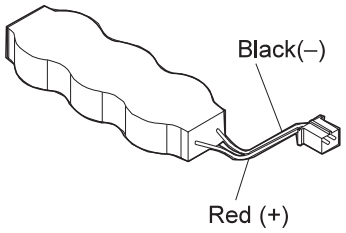
   Be careful not to cause a short circuit when measuring the voltage.

4. Measure the voltage of the standby battery.
   - If the voltage between red and black wire of the battery is 3.5 V dc or greater, the voltage is correct. Go to step 10 to verify standby battery operation.
   - If the voltage is less than 3.5 V dc, go to the next step.
5. Plug the AC Adapter into the computer and power on the computer.

   Attention

   Be careful not to cause a short circuit when measuring the voltage.

6. With the battery unplugged, measure the output voltage at the connector.



Pin	Voltage (V dc)
+	+4.0
–	Ground

   - If the voltage is less than +4.0 V dc, replace the DC/DC card. If the voltage is still low, replace the system board.
   - If the voltage is more than +4.0 V dc, power off the computer, replace the standby battery, and go to the next step.

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7. Ensure that the AC Adapter is plugged into the computer; then power on the computer.
8. Charging of the standby battery starts immediately. A depleted battery needs approximately 30 minutes to be recharged to the operational voltage of +3.5 V dc.
9. Unplug the AC Adapter.
10. Verify the standby battery function by removing and installing the battery pack during suspend mode.

    Note: Removing and installing the battery pack during suspend mode should be done within 1 minute. If the system does not resume after a charged battery pack is installed, replace the DC/DC card.

    If replacing the DC/DC card does not resolve the problem, replace the system board.

System Board and CPU Card Checkout

The processing functions are performed by both the system board and the CPU card. Processor problems can be caused by either FRU. However, the CPU card generally has a lower probability of failure. If a numeric code indicates the system board or the CPU card as a failing FRU, or the CPU card is indicated by a diagnostic test by showing FRU code 11, use the following procedure to isolate the problem:

1. Run the system board test to verify the symptom. This test verifies both the system board and the CPU card. If no error is detected, return to “Checkout Guide” on page 528.

   Note: Don't touch the keyboard and pointing device when the system board test is running. This may cause an unexpected error.
2. If FRU code 10 appears, replace the system board but do not replace the CPU card. Transfer the CPU card from the old system board to the new system board.
3. If FRU code 11 appears, reseat the CPU card.
4. Rerun the test to verify the fix.
5. If FRU code 11 remains, replace the CPU card.

If this procedure does not correct the problem, go to “Undetermined Problems” on page 561.

TrackPoint Checkout

If the TrackPoint does not work, check the configuration in the ThinkPad Configuration program. If the configuration of the TrackPoint is disabled, select **Enable** to enable it.

If this does not correct the TrackPoint problem, continue with the following.

The TrackPoint automatically compensates to adjust the pointer sensor. During this process, the pointer moves on

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the screen automatically for a short time. This self-acting pointer movement can occur when a slight, steady pressure is applied to the TrackPoint pointer while the computer is powered on or while the system is running, or when readjustment is required because the temperature has exceeded its normal temperature range. This symptom does not indicate a hardware problem. No service actions are necessary if the pointer movement stops in a short period of time.

If a click button problem or pointing stick problem occurs, do the following:

1. Go to the Easy-Setup menu.
2. Move to an item with the pointing stick.
3. Press any one of the three click buttons.
4. Verify that the item is selected.
5. Move to another item with the pointing stick.
6. Press the pointing stick (press-to-select).
7. Verify that the item is selected.
8. Verify that all buttons work correctly.

If either the pointing stick or the click button does not work, do the following actions one at a time to correct the problem. Do not replace a nondefective FRU.

- Reseat the TrackPoint cable.
- Replace the video card.
- Replace the system board.

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Power Management Features

Three power management modes are provided by the computer to reduce power consumption and prolong battery power.

Standby Mode

In standby mode the following occurs:

- The LCD backlight turns off.
- The hard disk motor stops.

Events that cause the computer to enter standby mode:

- Standby is requested by the **Fn** key (**Fn**+**F3**).
- There has been no activity and **auto-standby** was set in the ThinkPad Configuration program.

The computer exits standby mode and resumes operation when any key is pressed.

Suspend Mode

In suspend mode, the following occurs, in addition to standby mode:

- The LCD is powered off.
- The hard disk is powered off.
- The CPU stops.

Events that cause the computer to enter suspend mode:

- Suspend mode is requested by the **Fn** key (**Fn**+**F4**).
- The LCD is closed.
- The specified time has elapsed from the last operation with the keyboard, mouse, hard disk drive, parallel connector, or diskette drive; or the AC Adapter is plugged in. The time is specified by ***Suspend Timer*** in the ThinkPad Configuration program.
- The battery condition is low. The battery power indicator blinks orange.
- In the ThinkPad Configuration program, the computer can be set to “Hibernate when battery becomes low.” The default setting is suspend.
- Either the PS2 OFF or PS2 SUSpend command is set in the ThinkPad Configuration program.

Notes:

1. In the ThinkPad Configuration program, the computer can be set to “Will not suspend even if LCD is closed.”
2. In the ThinkPad Configuration program, the computer can be set to “suspend/hibernate while docked.”
3. When the computer is powered with ac power and is used with one of the communication PC Cards, the computer enters *standby mode*; the PC Card and application program remain active.
4. While the computer is attached to a Dock I, the

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computer cannot enter suspend mode.
5. The computer does not enter suspend mode when the eject lever of the UltraBay II pops out.

Events that cause the computer to resume operation from suspend mode:

- The LCD is opened.
- The real time clock alarm is signaled.
- The ring indicator (RI) is signaled by a serial or PCMCIA device.
- The **Fn** key is pressed.
- An external keyboard key is pressed while the computer is connected to ac power.

Computer also exits suspend mode when timer conditions are satisfied for entering hibernation mode.

Hibernation Mode

For the Windows NT User

Windows NT users cannot create a hibernation file in a system that uses the NTFS format system (the default format). If you want to use hibernation mode, you should reinstall Windows NT with a FAT format system.

Note: Before using hibernation mode, you need a hibernation file.

In hibernation mode, the following occurs:

- The system status, RAM, VRAM, and setup data are stored on the hard disk.
- The system is powered off.

Notes:

1. In the ThinkPad Configuration program, the computer can be set to “suspend/hibernate while docked.”
2. The computer cannot enter hibernation mode when:
   - It is powered with ac power and a communication PC Card is used.
   - It is attached to a Dock I.
   - When the eject lever of the UltraBay II pops out.

Events that cause the computer to enter hibernation mode:

- Hibernation mode is requested by the **Fn** key (**Fn**+**F12**).
- Timer conditions are satisfied in suspend mode.
- A critically low battery condition occurs.

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- The PS2 HIBernation command is set in the ThinkPad Configuration program.

The computer exits hibernation mode and resumes operation when the power-on switch is turned on.

When power is turned on, the hibernation history in the boot record on the hard disk is recognized and system status is restored from the hard disk to resume operation.

Symptom-to-FRU Index

The symptom-to-FRU Index lists the symptoms and errors and the possible causes. The most likely cause is listed first.

Note: Perform the FRU replacement or actions in the sequence shown in the "FRU/Action" columns. If replacing a FRU did not solve the problem, put the original part back in the computer. **Do not replace a nondefective FRU.**

This index can also be used to help you decide which FRUs to have available when servicing a computer.

Numeric error codes show the errors detected in POST or system operation. In the following error codes, **X** can be any number.

If no codes are available, use narrative symptoms.

If the symptom is not listed, go to "Undetermined Problems" on page 561.

Note: For IBM devices not supported by diagnostic codes in the ThinkPad notebook computers, see the manual for that device.

Numeric Error Codes

Symptom / Error	FRU / Action in Sequence
10X 101: Interrupt failure. 102: Timer failure. 103: Timer interrupt failure. 104: Protected mode failure. 105: Last 8042 command not accepted. 107: NMI test failure. 108: Timer bus test failure. 109: Low meg-chip select test.	**System board**

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Symptom / Error	FRU / Action in Sequence
110 (Planar parity.)	1. **The computer is attached to the expansion unit.**, 2. System board
111 (I/O parity.)	1. **Expansion Unit or Port Replicator** 2. System board
158 (The hard-disk password was not set even though the supervisor password is set.)	**Set hard-disk passwords for both the hard disk drive in the HDD bay and the one in the UltraBay.**
159 (HDP is not set the same as the supervisor password.)	**Set hard-disk passwords for the both hard disk drive in the HDD bay and the one in the UltraBay.**
161 (Dead battery.)	1. **Go to "Checking the Backup Battery (Nonrechargeable)" on page 536.** 2. Backup battery 3. System board
163 (Time and date were not set.)	1. **Set time and date.** 2. System board
173 (Configuration data was lost.)	1. **Select OK in the error screen; then set the time and date.** 2. Backup battery 3. System board
174 (Configuration error: Perform"Checking the Installed Devices List" on page 564 before changing any FRUs.)	1. **Check device configuration.** 2. Hard disk drive 3. System board
175, 177, 178 175: EEPROM CRC #1 error. 177: Supervisor password check sum error. 178: EEPROM is not functional.	**System board**
183 (An incorrect password was entered at the supervisor password prompt.)	**Have the user examine the password.**
184 (POP check sum error.)	**Reset the POP (power-on password) in Easy-Setup.**
185 (The startup sequence is not valid. Suspect that power was off when the startup sequence was being updated.)	**Reset the startup sequence in Easy-Setup.**

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Symptom / Error	FRU / Action in Sequence
186	**System board**
188 (EEPROM CRC #2 error.)	**Set the system identification using the "ThinkPad Hardware Maintenance Diskette. Version 1.40"**
190 (A depleted battery pack was installed when the power was on.)	**Go to "Checking the Battery Pack" on page 534.**
191XX (PM initialization error.)	1. **System board** 2. CPU card
195 (The configuration read from the hibernation area does not match the actual configuration.)	**Check if the configuration was changed.** For example, check if a DIMM is added or if the disk drive is from another computer.
196 (A read error occurred in the hibernation area of the HDD.)	1. **Run the hard disk drive test.** 2. Hard disk drive
1XX	**System board**
2XX 201: Memory data error. 202: Memory line error 00–15. 203: Memory line error 16–23. 205: Memory test failure on on-board memory. 221: ROM to RAM remap error.	1. **Go to "Memory Checkout" on page 532.** 2. DIMM 3. System board
301, 303, 304, 305, 3XX (301: Keyboard error.)	1. **Go to "Keyboard or Auxiliary Input Device Checkout" on page 531.** 2. Keyboard 3. Video card 4. External numeric keypad 5. External keyboard 6. Keyboard/mouse cable 7. DC/DC card 8. System board
601, 6XX (601: Diskette drive or controller error.)	1. **Go to "Diskette Drive Checkout" on page 529.** 2. Diskette drive 3. Diskette 4. System board

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Symptom / Error	FRU / Action in Sequence
602 (Diskette read error.)	1. **Go to "Diskette Drive Checkout" on page 529.** 2. Diskette 3. Diskette drive
604 (An unacceptable ID was read from the diskette drive.)	1. **Go to "Diskette Drive Checkout" on page 529.** 2. Diskette drive 3. System board
11XX 1101: Serial_A test failure.	1. **Serial device** 2. Communication cable 3. System board
17XX 1701: Hard disk controller failure. 1780, 1790: Hard disk 0 error. 1781, 1791: Hard disk 1 error.	1. **Hard disk drive** 2. System board
24XX (2401: System board video error.)	1. **System board** 2. Video card
808X 8081: Presence test failure. (PCMCIA revision number also checked.) 8082: PCMCIA register test failure.	1. **PCMCIA slot assembly** 2. PCMCIA device 3. System board 4. PC Card in docking station/PC Card enabler
860X (Pointing device error when TrackPoint III is disabled.) 8601: System bus error—8042 mouse interface. 8602: External mouse error. 8603: System bus or mouse error.	1. **External mouse** 2. External keyboard 3. System board
861X (Pointing device error when TrackPoint III is enabled.) 8611: System bus error—I/F between 8042 and IPDC. 8612: TrackPoint error. 8613: System board or TrackPoint error.	1. **Reseat the keyboard connector on the video card.** 2. Reseat the TrackPoint III cable on the keyboard card. 3. Keyboard 4. External mouse 5. Video card 6. System board

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Symptom / Error	FRU / Action in Sequence
I9990301 **I9990302** **I9990305** I9990301: Hard disk error. I9990302: Invalid hard disk boot record. I9990305: No bootable device.	1. **Check that the operating system is installed in the HDD. If not, install the operating system.** 2. Reseat the boot device. 3. Check the startup sequence for the correct boot device. 4. Check that the operating system has no failure and is installed correctly.
I9990303 (Bank–2 flash ROM check sum error.)	**System board**
Other codes, not in this list	**Go to "Undetermined Problems" on page 561.**

Diagnostic Error Codes

If an error is detected, the following appears:

- Large **X** on the left side of the device icon.
- Device ID (three digits)
- Error code (two digits)
- FRU code (four digits)

The device ID and error code indicate the detailed portion of the FRU that caused the error. If replacing a FRU does not correct the problem, see the device ID or error code from the previous failure. If they have changed, the cause might be because the new FRU is detective or the FRU was incorrectly installed.

Device ID: If an error is detected by the diagnostic tests, a three-digit device ID is displayed, indicating the suspected device.

Icon	Device ID	Suspected Device
SystemBoard	001	System board
	003	Keyboard
	007	Math coprocessor
	086	Pointing device

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Icon	Device ID	Suspected Device
Memory	002	Memory
Display	050	Display
	052	
	053	
HDD-1	017	Hard disk drive
HDD-2	151	Hard disk in UltraBay II
HDD-3	067	First external hard disk drive
HDD-4	152	Second external hard disk drive
FDD-1	006	FDD in the UltraBay II
FDD-2	066	External diskette drive or FDD connector of the port replicator
PCMCIA-1	080	1. Connection of the PCMCIA slot 2. PCMCIA
PCMCIA-2	088	External PCMCIA
Parallel	009	Parallel
Serial	011	Serial
DSP	113	DSP
CDROM-1	215	CD-ROM
CDROM-2	216	External CD-ROM

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Icon	Device ID	Suspected Device
Infrared	103	IR
Audio	153	Audio (Crystal)
DVD-1	217	DVD drive in UltraBay II
DVD-2	218	External DVD drive
USB-1	154	USB port
USB-2	155	USB port of the port replicator
USB-3	156	First external USB port
USB-4	157	Second external USB port

FRU Codes: If an error is detected by the diagnostic tests, a four-digit FRU code is displayed. The FRU code indicates two suspected FRUs. Replace the FRU that is indicated by the ***two leftmost digits*** first; then replace the FRU that indicated by the ***two rightmost digits.*** No FRU is assigned to code 00. If only one FRU is suspected, the other FRU code is filled with zeros. See the reference page before replacing the FRU.

FRU Code	FRU
10	System board
11	CPU card
12	DC/DC card
16	Modem card

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FRU Code	FRU
20	Memory (see “Memory Checkout” on page 532)
30	Reserved
32	External keyboard
33	External mouse
34	AC Adapter
35	Speaker
36	Battery in the battery bay
37	Battery in the UltraBay II
38	Fan
40	LCD unit
41	DVD Adapter Card
42	Video card
45	External CRT
50	1. Reseat the diskette drive (FDD-1). 2. Reseat the external FDD cable on the video card. 3. Diskette drive (FDD-1)
51	1. Reseat the diskette drive (FDD-2). 2. Diskette drive (FDD-2)
60	1. Reseat the hard disk drive (HDD-1). 2. Hard disk drive (HDD-1)
61	1. Reseat the hard disk drive (HDD-3). 2. Hard disk drive (HDD-3)
62	1. Reseat the hard disk drive in UltraBay II (HDD-2). 2. Hard disk drive in UltraBay II (HDD-2)
63	1. Reseat the hard disk drive (HDD-4). 2. Hard disk drive (HDD-4)
70	PCMCIA-2 (replicator)
72	1. Reseat the PCMCIA slot assembly 2. PCMCIA slot assembly
73	Port replicator
74	Main board of the docking station
75	USB card of the docking station
90	CD-ROM drive
91	External CD-ROM drive
92	DVD drive
93	External DVD drive

Note: The device ID and error codes are used to indicate the detailed portion of the FRU that caused the error. If replacing a FRU does not correct the problem, see the device ID or error code from the previous failure. If they have changed, the cause

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might be because the new FRU is defective or that the FRU was incorrectly installed.

If the problem persists after replacement of the FRUs, go to “Undetermined Problems” on page 561.

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Beep Symptoms

Symptom / Error	FRU / Action in Sequence
Continuous beeps.	**System board**
One beep and a blank, unreadable, or flashing LCD.	1. **Reseat the LCD connector**. 2. Reseat the inverter card. 3. Inverter card 4. Video card 5. LCD unit 6. System board 7. DC/DC card
One beep, and the message "Unable to access boot source."	1. **Boot device** 2. System board
One long and two short beeps, and a blank or unreadable LCD.	1. **System board** 2. Video card 3. LCD unit
One long beep followed by four short beeps each time the power switch is operated. (System cannot power-on due to low battery voltage.)	**Connect the AC Adapter or install a fully charged battery.**
One beep every second. (System is shutting down due to low battery voltage.)	**Connect the AC Adapter or install a fully charged battery. (Allow the system to completely shut down before changing the battery.)**
Two short beeps with error codes.	**POST error. See "Numeric Error Codes" on page 542.**
Two short beeps with blank a screen.	**System board**

No Beep Symptoms

Symptom / Error	FRU / Action in Sequence
No beep, power-on indicator not on, and a blank LCD during POST.	1. **Go to "Power Systems Checkout" on page 533.** 2. System board 3. DC/DC card 4. Power sources
No beep, power-on indicator on, and a blank LCD during POST.	1. **System board** 2. DC/DC card 3. CPU card
No beep, power-on indicator on, and a blinking cursor only during POST.	1. **System board** 2. CPU card 3. DC/DC card

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Symptom / Error	FRU / Action in Sequence
No beep during POST but system runs correctly.	1. **Turn the volume up and check the speaker.** 2. Speaker 3. DC/DC card

Audio-Related Symptoms

Symptom / Error	FRU / Action in Sequence
In OS/2, DOS, or Windows multimedia programs, no sound comes from the computer. (Only system beeps are heard at power-on.)	**Check that the device driver is installed correctly.**

CD-ROM-Related Symptoms

Symptom / Error	FRU / Action in Sequence
You hear a noise from the CD-ROM drive when the CD-ROM is spinning.	1. **CD-ROM drive** 2. System board
The CD-ROM tray does not open even if you press the CD-ROM eject button.	**Insert a pin into the CD-ROM emergency eject hole and eject the CD-ROM tray.**
The compact disc cannot be read.	Make sure that: • The compact disc is not dirty. If it is, clean it with a CD-ROM cleaner kit. • The compact disc is not defective. If it is, try another compact disc. • The compact disc is placed in the tray with the label side up. • The compact disc format conforms with one of the following: – Music CD – CD-ROM or CD-ROM XA – Multisession photo CD – Video CD and CD-i movie (Windows 95 does not support CD-i movies) 1. **CD-ROM drive** 2. System board

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Symptom / Error	FRU / Action in Sequence
The CD-ROM does not work.	Make sure that: • The computer power is turned on and a compact disc is in the CD-ROM drive. • The CD-ROM drive connector is firmly connected to the computer. • The CD-ROM drive tray is firmly closed. • The device drivers are correctly installed. • If the CD-ROM drive in the IBM ThinkPad Dock I does not work, do the following: 1. Click on **Start**. 2. Move the cursor to **Programs** and **ThinkPad**; then click on **ThinkPad Configuration**. 3. Click on **Docking Station**. 4. Make sure that you checked **Enable IDE device in the docking station**. **Note:** Do not use IRQ 11 and 15 for the PCI device setting. 5. Click on **OK**. 1. **CD-ROM drive** 2. System board

DVD-Related Symptoms

Symptom / Error	FRU / Action in Sequence
You hear a noise from the DVD drive when the DVD disk or compact disk is spinning.	1. **DVD drive** 2. System board
The DVD tray does not open even if you press the DVD eject button.	**Insert a pin into the DVD emergency eject hole and eject the DVD tray.**

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Symptom / Error	FRU / Action in Sequence
The DVD disc or compact disc cannot be read.	Make sure that: • The DVD disc or compact disc is not dirty. If it is, clean it. • The DVD disc is not defective. If it is, try another DVD disc. • The DVD disc is placed in the tray with the label side up. • The DVD disc format conforms with one of the following: – Music CD – CD-ROM or CD-ROM XA – Multisession photo CD – Video CD and CD-i movie (Windows 95 does not support CD-i movie) – DVD-ROM (DVD-video) – DVD-movie with MPEG hardware and software 1. **DVD drive** 2. System board

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Symptom / Error	FRU / Action in Sequence
The DVD does not work.	Make sure that: • The computer power is turned on and a DVD disc or a compact disc is in the DVD drive. • The DVD drive connector is firmly connected to the computer. • The DVD drive tray is firmly closed. • The device drivers are correctly installed. • If the DVD drive in the IBM ThinkPad Dock I does not work, do the following: 1. Click on **Start**. 2. Move the cursor to **Programs** and **ThinkPad**; then click on **ThinkPad Configuration**. 3. Click on **Docking Station**. 4. Make sure that you checked **Enable IDE device in the docking station**. **Note:** Do not use IRQ 11 and 15 for the PCI device setting. 5. Click on **OK**. 1. **DVD drive** 2. System board

Function-Related Symptoms

Symptom / Error	FRU / Action in Sequence
Battery Fuel-Gauge does not go higher than 90%.	**Go to "Checking the Battery Pack" on page 534 and see the note.**
Memory count (size) appears different from actual size.	**Go to "Memory Checkout" on page 532.**
System configuration does not match the installed devices.	**Go to "Checking the Installed Devices List" on page 564.**

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Symptom / Error	FRU / Action in Sequence
System hangs intermittently.	**Go to "Intermittent Symptoms" on page 560.**
The system does not suspend or resume when the LCD is closed or opened.	1. **Go to "Suspend Mode" on page 540, and check that the computer can enter suspend mode.** 2. Boot an operating system and press **Fn**+**F4**. If the computer enters suspend mode, suspect that the application program is not working properly. 3. LCD unit 4. Video card 5. System board

Indicator-Related Symptoms

Symptom / Error	FRU / Action in Sequence
Indicator incorrectly remains off or on, but system runs correctly.	**1. Reseat the LCD connector on the video card.** 2. LCD cable assembly 3. Video card 4. System board

Indicator Panel-Related Symptoms

Symptom / Error	FRU / Action in Sequence
An icon in the indicator panel remains off or on, but the system runs correctly.	1. **Reseat the keyboard connector on the video card.** 2. Reseat the indicator panel cable on the video card. 3. Keyboard 4. Video card 5. System board

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Infrared-Related Symptoms

Symptom / Error	FRU / Action in Sequence
Unable to communicate using the Infrared (IR) Port.	1. **Make sure the setup for the IR is correct.** 2. Make sure there are no fluorescent lights near the computer. The computer may receive optical noise from the fluorescent light. 3. Run the advanced diagnostic test. (see "Running the Diagnostics" on page 563) If an error occurs and a FRU code is displayed, replace the parts shown by the FRU code.

Keyboard- or TrackPoint III-Related Symptoms

Symptom / Error	FRU / Action in Sequence
Keyboard (one or more keys) does not work.	1. **Reseat the keyboard cables on the video card.** **2. Keyboard** **3. Video card** **4. System board**
TrackPoint III does not work.	1. **Reseat the keyboard cables on the video card**. 2. Go to "TrackPoint Checkout" on page 538. 3. Keyboard 4. Video card 5. System board
Pointer moves automatically or does not work correctly.	**See "TrackPoint Checkout" on page 538.**

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LCD-Related Symptoms

Important

The LCD for the notebook computer contains over 2,359,296 thin-film transistors (TFTs). A small number of missing, discolored, or lighted dots (on all the time) is characteristic of TFT LCD technology, but excessive pixel problems can cause viewing concerns. The LCD should be replaced if the number of missing, discolored, or lighted dots in any background is 21 or more.

Symptom / Error	FRU / Action in Sequence
No beep, power-on indicator on, and a blank LCD during POST.	1. **Reseat the CPU card**. 2. DC/DC card 3. Video card 4. System board 5. LCD cable assembly
• LCD backlight not working • LCD too dark • LCD brightness cannot be adjusted (TFT)	1. **Reseat the LCD connectors.** 2. LCD unit 3. DC/DC card 4. Cable for inverter card 5. Inverter card
• LCD screen unreadable • Characters missing pels • Screen abnormal • Wrong color displayed	1. **See important note for "LCD-Related Symptoms" on page 47.** 2. Reseat all LCD connectors. 3. LCD unit 4. System board 5. Video card
LCD has extra horizontal or vertical lines displayed.	1. **LCD cable assembly** 2. LCD unit

Modem (DSP)-Related Symptoms

Symptom / Error	FRU / Action in Sequence
In OS/2, DOS, or Windows multimedia programs, no sound comes from the computer. (Only system beeps are heard at power-on.)	**Check that the device driver is installed correctly.**
In OS/2, DOS, or Windows, the modem does not work.	**Check that the DSP Modem is active.** ***OS/2 and Windows:*** Click the **DSP Modem** icon in the ThinkPad Configuration program. ***DOS:*** Run the **MWMODEM ON** command.

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PC Card-Related Symptoms

Symptom / Error	FRU / Action in Sequence
PC Card does not work either in the upper slot or the lower slot. Diagnostic error code: DEV 080 ERR 33 FRU 7210	1. **Reseat the PCMCIA slot assembly**. 2. PCMCIA slot assembly 3. System board
PCMCIA slot pin is damaged.	**PCMCIA slot assembly**
PC Card does not work.	1. **Reseat the PC Card** 2. Check the PC Card is enabled in the ThinkPad Configuration program 3. Reseat the PCMCIA slot assembly. 4. PCMCIA slot assembly 5. System board

Peripheral-Device-Related Symptoms

Symptom / Error	FRU / Action in Sequence
External display does not work correctly.	**See "External Display Self-Test" on page 682.**
Printer problems.	1. **Run printer self-test**. 2. Parallel port device 3. Cable 4. System board
Parallel port device problems.	1. **Device** 2. Device cable 3. System board
Serial port device problems.	1. **Device** 2. Device cable 3. DC/DC card
External diskette drive does not work correctly, or internal diskette drive is not recognized.	1. **Reseat the external FDD connector.** 2. External diskette drive 3. Make sure that the diskette is not damaged.

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Power-Related Symptoms

Symptom / Error	FRU / Action in Sequence
Power shuts down during operation.	1. **Go to "Power Systems Checkout" on page 533.** 2. Battery pack 3. Remove the battery pack and let it cool for 2 hours. 4. DC/DC card 5. Power sources
The system does not power off. (See "Reset Switch" on page 527.)	1. **Press the power shutdown switch.** 2. System board

Other Symptoms

Symptom / Error	FRU / Action in Sequence
Errors occur only when the port replicator is used.	**See "Port Replicator Checkout" on page 36.**

Note: If you cannot find a symptom or error in this list and the problem persists, see "Undetermined Problems" on page 561.

Intermittent Symptoms

Intermittent system hang problems can be caused by a variety of reasons that have nothing to do with a hardware defect, such as: cosmic radiation, electrostatic discharge, or software errors. FRU replacement should be considered only when a recurring problem exists.

When analyzing the intermittent problem, do the following:

1. Run the advanced diagnostic test for the system board in loop mode at least 10 times.
2. If no error is detected, do **not** replace any FRUs.
3. If any error is detected, replace the FRU shown by the FRU code. Rerun the test to verify that no more errors exist.

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Undetermined Problems

You are here because the diagnostic tests did not identify which adapter or device failed, installed devices are incorrect, a short circuit is suspected, or the system is inoperative. Follow these procedures to isolate the failing FRU (**never replace nondefective FRUs**).

Verify that all attached devices are supported by the computer.

Verify that the power supply being used at the time of the failure is operating correctly. (See "Power Systems Checkout" on page 533.)

1. Power off the computer.
2. Check the cables, wires, and connectors for short circuits and open circuits. Visually check them for damage. If any problems are found, replace the FRU.
3. Remove or disconnect all of the following devices:
   a. Non-IBM devices
   b. Devices attached to the expansion bus connector
   c. Printer, mouse, and other external devices
   d. Battery pack
   e. Hard disk drive
   f. Diskette drive, CD-ROM drive, or DVD drive
   g. DIMM
   h. PC Cards
4. Power on the computer.
5. Determine if the problem has changed.
6. If the problem does not recur, reconnect the removed devices one at a time until you find the failing FRU.
7. If the problem remains, replace the following FRUs one at a time. Do not replace a nondefective FRU.
   - DC/DC card
   - Video card
   - LCD unit
   - System board
   - CPU card

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Related Service Procedures

This section provides information about the following:

- “Status Indicators”
- “Indicator Panel”
- “Running the Diagnostics” on page 563
- “Displaying the Error Log” on page 564
- “Checking the Installed Devices List” on page 564
- “Password Combinations (POP, HDP, PAP)” on page 565
- “Running a Low-Level Format” on page 565
- “Checking the PC Test Card LED” on page 565
- “Fn Key Combinations” on page 566

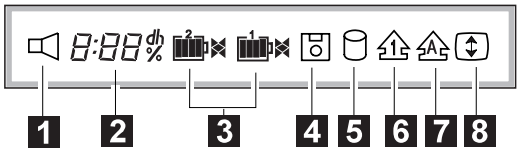
Status Indicators

The system status indicators show the current computer status in different colors (green and orange).

Symbol	Color	Meaning
	Green	Battery fully charged
	Orange	Battery charging
	Blinking orange	Battery needs charging
	Green	Computer is in suspend mode.
	Blinking green	Computer is entering suspend mode or hibernation mode, or resuming normal operation.
	Green	Power on

Indicator Panel

The Indicator panel shows the current computer status using these icons.



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Icon	Meaning
1	Speaker
2	Remaining battery
3 (left)	Secondary battery status
3 (right)	Main battery status
4	Diskette drive in-use
5	Hard disk in-use
6	Numeric lock
7	Caps lock
8	Scroll lock

Running the Diagnostics

Use either the TrackPoint III or the cursor-moving keys to interact with the tests. The **Enter** key works the same as selecting the **OK** icon to reply OK.

The following are required:

FDD:	Erasable 2HD diskette
Parallel:	Wrap plug (P/N 72X8546)
Serial:	Wrap plug (P/N 72X8546)
PCMCIA:	PC Test Card (P/N 35G4703)
CDROM:	Any CD (data CD is recommended)
DVD:	Any CD (don't use DVD disc, but use data CD)
USB:	USB-Parallel Wrap Cable (P/N 05K2580)

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1. Press and hold the **F1** key; then power on the computer. Hold the **F1** key down until the Easy-Setup menu appears.
2. Select **Test** and press Enter.
3. Select a device and press **Enter** to run the test.

   The test progress window appears. **OK** appears when the test ends without any errors.
4. Start the **Advanced Diagnostic test** by doing one of the following on the basic diagnostic menu screen:
   - Press **Ctrl**+**A**.
   - Triple-click on the icon at the bottom right corner.
5. The ThinkPad FRU Connections window appears, showing the state of all connectors. Check the connector if the **Not connected** message appears.
6. Click on **Exit** or press **Esc** to exit.
7. The keyboard test window appears.

   Check the keyboard.
8. Click on **Exit** on the screen or press **Ctrl**+**Pause** to exit.
9. Select a device and press **Enter** to start the tests.
10. Select **Test All** to test all devices.
11. Select **Loop Test** to run the tests in a repeated loop. A loop option menu appears in which a device loop or all-device loop can be selected. Press the **Spacebar** to select a device. Repeat this step to select multiple devices. Press **Enter** to start the diagnostic loop. If no device is selected, all device tests are looped.
12. To exit the loop, keep pressing **Ctrl**+**Pause** until the test exits. A beep sounds to notify that the exit interrupt is sensed by the test program.

Displaying the Error Log

Diagnostic errors are printed by a printer attached to the parallel port when the error is detected. The error is also logged in the system memory.

Do the following to display the errors.

1. End the test, if it is running.
2. Press **Ctrl**+**A** to select the advanced diagnostic mode.
3. Press **Esc** to exit the ThinkPad FRU Connections window.

   The keyboard test window appears.
4. Press **Ctrl**+**Pause** to exit the keyboard test window.
5. Press **Ctrl**+**E**.
6. The error log appears.
7. To exit, select the **Cancel** icon or press **Esc**.

The error log is not saved when the system is powered off.

Checking the Installed Devices List

If a device is installed but the icon appears in a gray shade rather than a dark shade on the basic diagnostics window, the device is defective. Reseat the device connectors. If

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the symptom remains, replace the device or the system board. If needed, adjust the contrast control to clearly distinguish the shades of the icon.

If a device that is not installed appears in a dark shade (for example, FDD-2 appears in a dark shade when *no* second FDD is installed), do the following:

1. Replace the **first** device in the configuration, such as an FDD-1.
2. If the problem remains, replace the system board.

The parallel, and serial icons are always displayed in a dark shade, because the icons represent subsystems of the system board, not the attachment of the devices.

Password Combinations (POP, HDP, PAP)

When the power-on password (POP), hard disk password (HDP), and supervisor password (PAP) are used, the following situations may occur:

- ***When the POP is the same as the HDP-1 or HDP-2***

  The POP prompt appears, but one of the HDP prompts does not appear.

- ***When the POP is not the same as the HDP-1 and HDP-2***

  The POP, HDP-1, and HDP-2 prompts all appear.

- ***PAP and HDP-1 or HDP-2***

  When the PAP is used, the HDP-1 or HDP-2 is enabled automatically, but no HDP prompt appears. The HDP-1 and HDP-2 are set the same as the PAP.

Running a Low-Level Format

Do the following to format the hard disk.

Attention: Make sure the drive address to be formatted is correct. This procedure erases all information on the disk.

1. Power off the computer.
2. Insert the "ThinkPad Hardware Maintenance Diskette Ver 1.40" or later into diskette drive **A** and power on the computer.
3. Select **Format the hard disk** from the main menu.
4. Select the drive from the menu.
5. Follow the instructions on the screen.

Checking the PC Test Card LED

The green LED on the PC test card turns on when the PCMCIA test is running. If the LED does not turn on, check that the card is installed correctly by reseating the card. If it still does not turn on after it is reseated, try using another slot for the test. If the LED still does not

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turn on and the test fails, replace the FRU shown by the diagnostic error code.

Fn Key Combinations

The following table shows the **Fn** key and function key combinations and their corresponding functions.

The **Fn** key works independently from the operating system. The operating system obtains the status through the system management interface to control the system.

Fn +	**Description**
F1	Reserved
F2	Fuel-Gauge display on or off
F3	Standby mode invocation
F4	Suspend mode invocation
F5	Reserved
F6	Reserved
F7	Switching display between LCD and CRT
F8	Switching display between expansion and shrink
F9	Reserved
F10	Reserved
F11	Switching power management mode (High Performance, Automatic, and Customized)
F12	Hibernation invocation

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Product Overview (770)

The following table shows an overview of the system features:

Feature	Description
Processor	Intel® Pentium® MMX™ 200 MHz, 512 KB L2 Cache
Intel® Pentium® MMX™ 233 MHz, 512 KB L2 Cache	
Bus architecture	PCI bus
Memory (standard)	32 MB (on the system board) and 16 MB as DIMM)
Memory (option)	8 MB, 16 MB, 32 MB, 64 MB, and 128 MB DIMM card (max. 256 MB)
CMOS RAM	114 bytes + 4 kilobytes
Video	• 13.3-inch, 64K colors, 1024×768 pixel XGA TFT color LCD • 14.1-inch, 64K colors, 1024×768 pixel XGA TFT color LCD
Diskette drive (removable)	• 720KB, 1.2MB, 1.44MB (3-mode), 3.5-inch
Hard disk drive (removable)	• 3.2GB, 2.5-inch • 4.0GB, 2.5-inch • 5.1GB, 2.5-inch
Modem card	• Fax/modem function • Telephony function • ThinkPad modem function
Crystal audio	Stereo audio function
Infrared transfer	• Two IR ports • IrDA 1.0 • ASK • 1.15 million bps
PC Card, CardBus, MPEG card	One Type-III or two Type-II

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FRU Removals and Replacements

This section contains information about removals and replacements.

- Do not damage any parts. Only certified and trained personnel should service the computer.
- The arrows in this section show the direction of movement to remove a FRU, or to turn a screw to release the FRU. The arrows are marked in numeric order, in square callouts, to show the correct sequence of removal.
- When other FRUs that must be removed before the failing FRU is removed, they are listed at the top of the page.
- To replace a FRU, reverse the removal procedure and follow any notes that pertain to replacement. See “Locations” on page 607 for internal cable connections and arrangement information.
- When replacing a FRU, use the correct screw size, as shown in the procedure.

Safety Notice 1: Translation on page 8

Before the computer is powered-on after FRU replacement, make sure all screws, springs, or other small parts, are in place and are not left loose inside the computer. Verify this by shaking the computer and listening for rattling sounds. Metallic parts or metal flakes can cause electrical short circuits.

Safety Notice 3: Translation on page 10

The battery pack contains small amounts of nickel. Do not disassemble it, throw it into fire or water, or short-circuit it. Dispose of the battery pack as required by local ordinances or regulations.

Safety Notice 8: Translation on page 14

Before removing any FRU, power-off the computer, unplug all power cords from electrical outlets, remove the battery pack, and then disconnect any interconnecting cables.

An electrostatic discharge (ESD) strap must be used to establish personal grounding.

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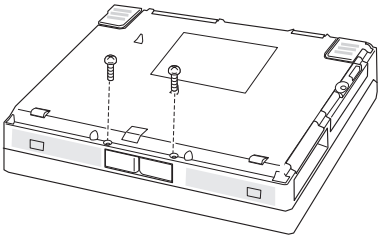
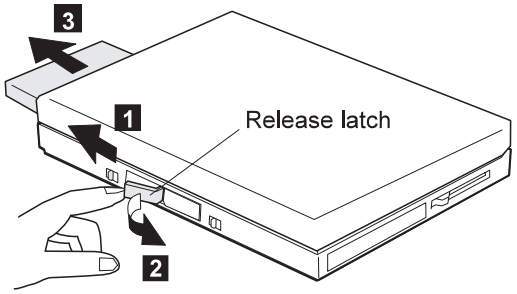
1010 Battery Pack

Note

If the customer has locked the eject lever with security screws, remove the screws first.





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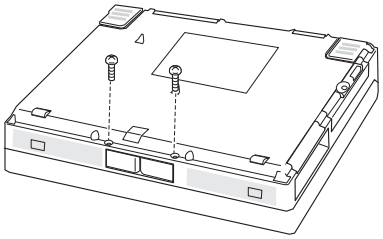
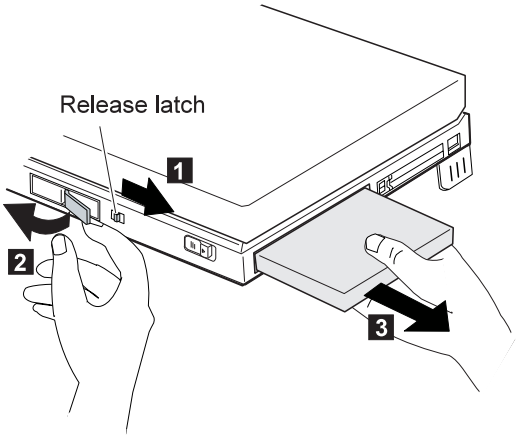
1020 UltraBay II Device or 2nd Battery Pack

- Battery Pack **(1010)**

Note

If the customer has locked the eject lever with security screws, remove the screws first.





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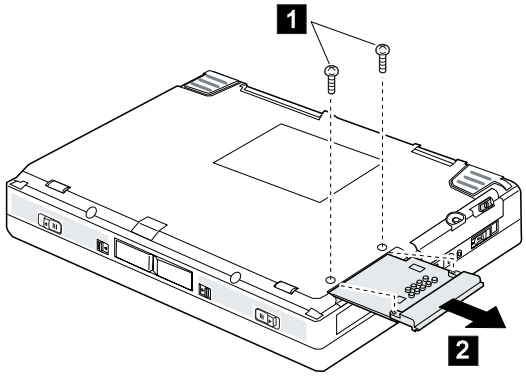
1030 DVD Adapter Card

- Battery Pack **(1010)**
- 2nd Battery Pack (if installed) **(1020)**



Step	Size (Quantity)	Color	Torque
1	M2.5 x 6 mm, Nylon (2)	Black	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.			

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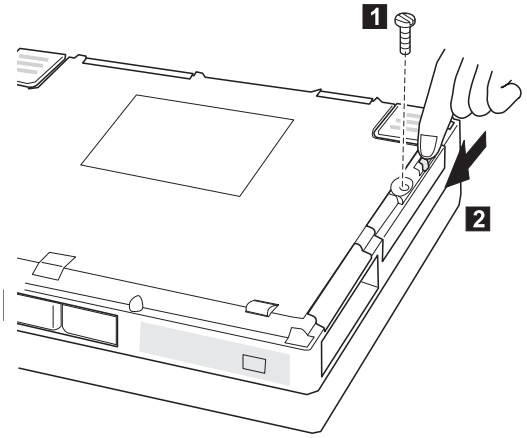
1040 Hard Disk Drive

- Battery Pack **(1010)**
- 2nd Battery Pack (if installed) **(1020)**

Attention

Do not drop or apply any shock to the hard disk drive. The hard disk drive is sensitive to physical shock. Incorrect handling can cause damage and permanent loss of data on the hard disk. Before removing the hard disk drive, have the user make a backup copy of all the information on the hard disk. Never remove the hard disk drive while the system is operating or is in suspend mode.

Note: Remove the hard disk drive exactly as shown in the figure. Do not apply any extra force to the hard disk drive when removing it.



Step	Size (Quantity)	Color	Torque
1	Coin screw (1) —or— Security screw (1)	Black	—

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

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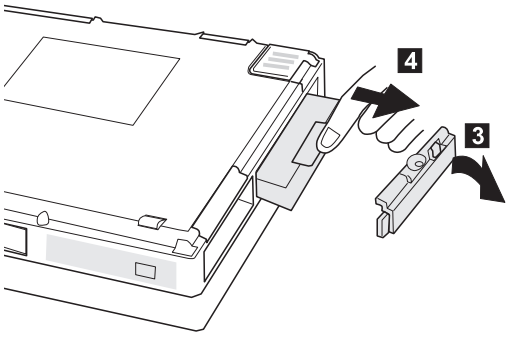
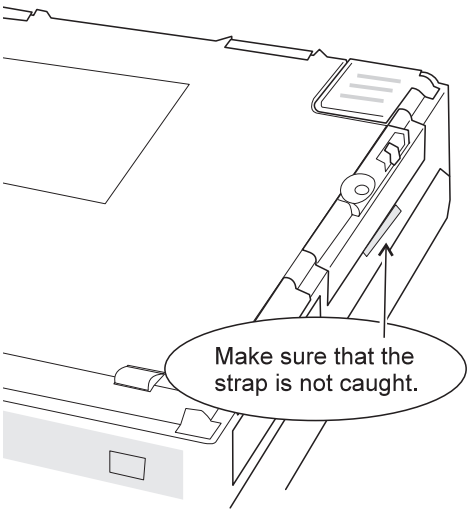


When replacing:



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1050 Backup Battery or DIMM

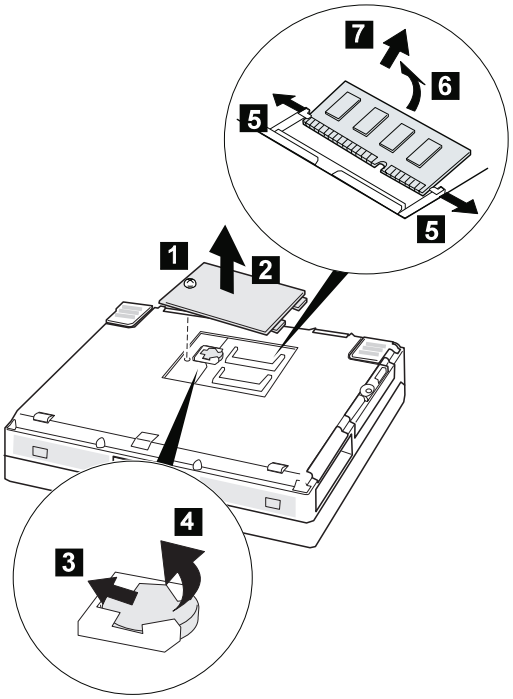
- Battery Pack **(1010)**
- 2nd Battery Pack (if installed) **(1020)**

1 2 : DIMM cover

1 2 3 4 : Backup battery

1 2 5 6 7 : DIMM

Note: Only loosen the screw in step 2 .



Step	Size (Quantity)	Color	Torque
1	Cannot be removed	—	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.			

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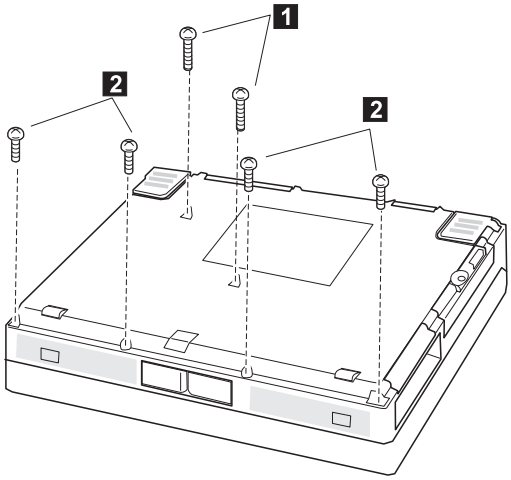
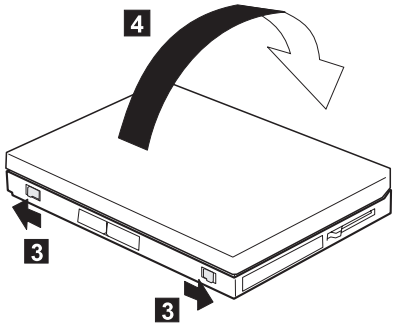
1060 Keyboard Unit

- Battery Pack **(1010)**
- 2nd Battery Pack (if installed) **(1020)**





Step	Size (Quantity)	Color	Torque
1	M2.5 x 8 mm, Nylon (2)	Black	4 kgcm
2	M2.5 x 6 mm, Nylon (4)	Black	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.			

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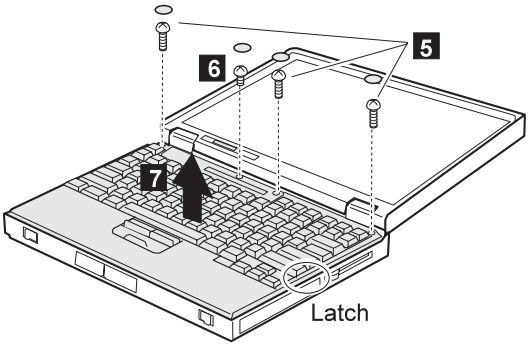
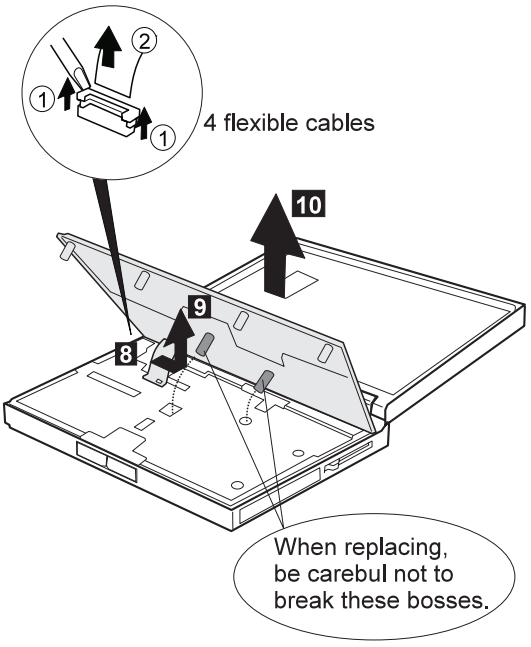


Step	Size (Quantity)	Color	Torque
5	M2.5 x 8 mm, Nylon (3)	Black	4 kgcm
6	M2.5 x 4 mm, Nylon (1)	Black	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.			



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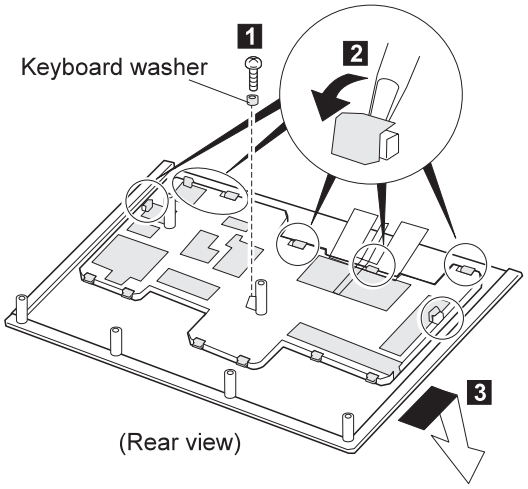
1065 Keyboard, Keyboard Bezel, Indicator Panel

- Battery Pack **(1010)**
- 2nd Battery Pack (if installed) **(1020)**
- Keyboard Unit **(1060)**

Keyboard



Step	Size (Quantity)	Color	Torque
1	M2.5 x 4 mm, Nylon (1)	Yellow	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.			

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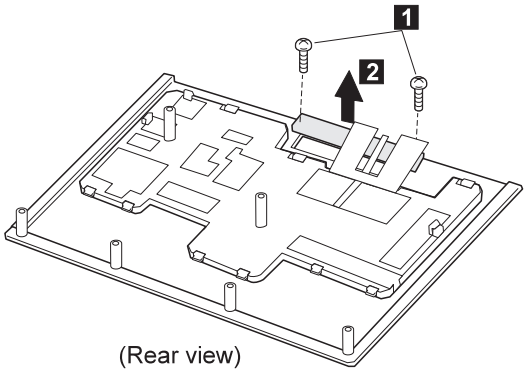
Keyboard Bezel or Indicator Panel



(Rear view)

Step	Size (Quantity)	Color	Torque
1	M2.5 x 4 mm, Nylon, flathead (2)	Black	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.			

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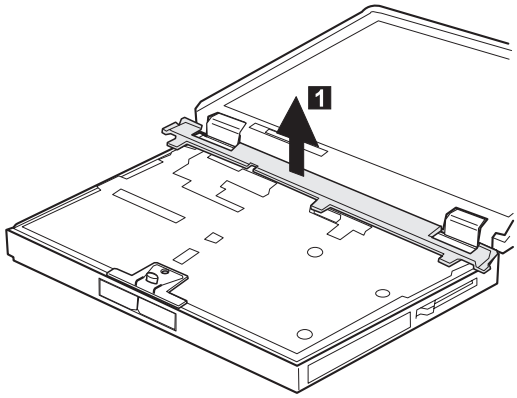
1070 Center Cover and Hinge Cover

- Battery Pack **(1010)**
- 2nd Battery Pack (if installed) **(1020)**
- Keyboard Unit **(1060)**

1 : Center Cover

2 **3** : Hinge Cover



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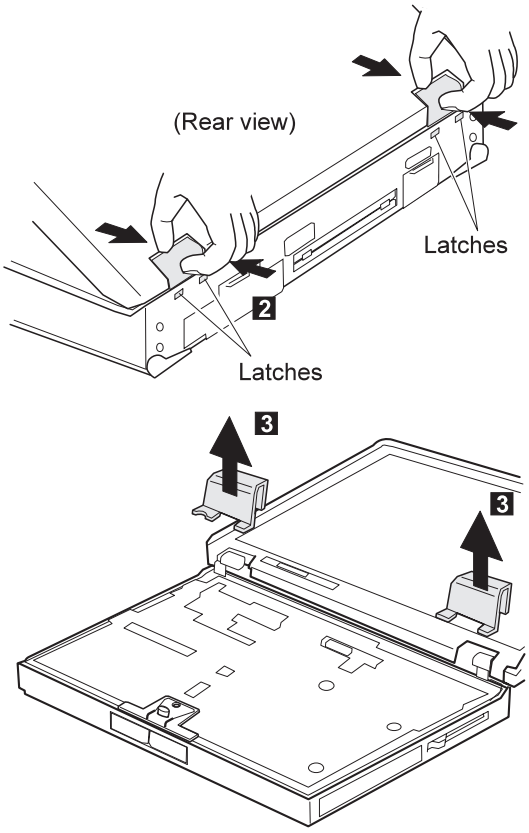

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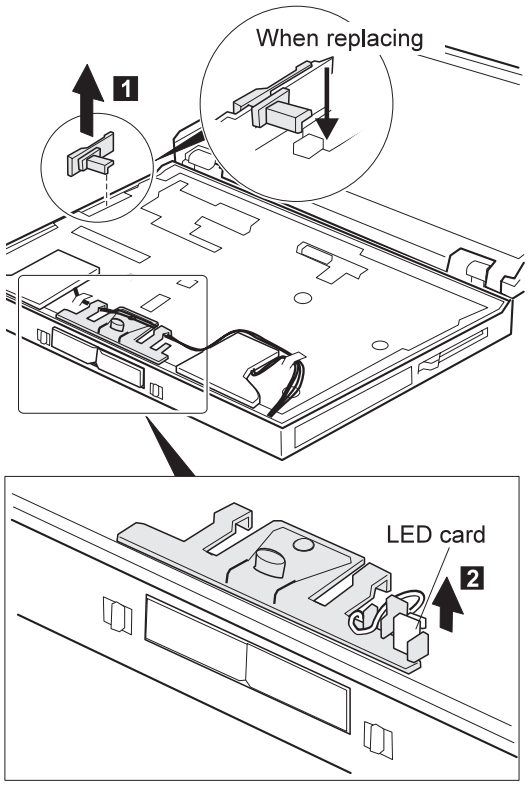
1080 Eject Lever and Power Switch

- Battery Pack **(1010)**
- UltraBay II Device or 2nd Battery Pack **(1020)**
- Keyboard Unit **(1060)**
- Hinge Cover and Center Cover **(1070)**

1 : Power switch

2 **3** **4** : Eject lever



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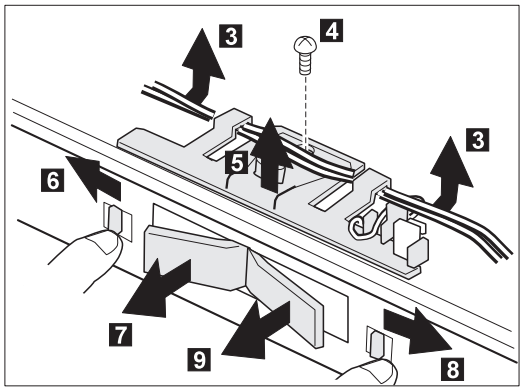
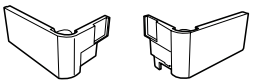


Step	Size (Quantity)	Color	Torque
4	M2.5 x 4 mm, Nylon (1)	Yellow	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.			

When replacing:

1. Make sure the right and left eject lever and replace the correct lever.



Left Right

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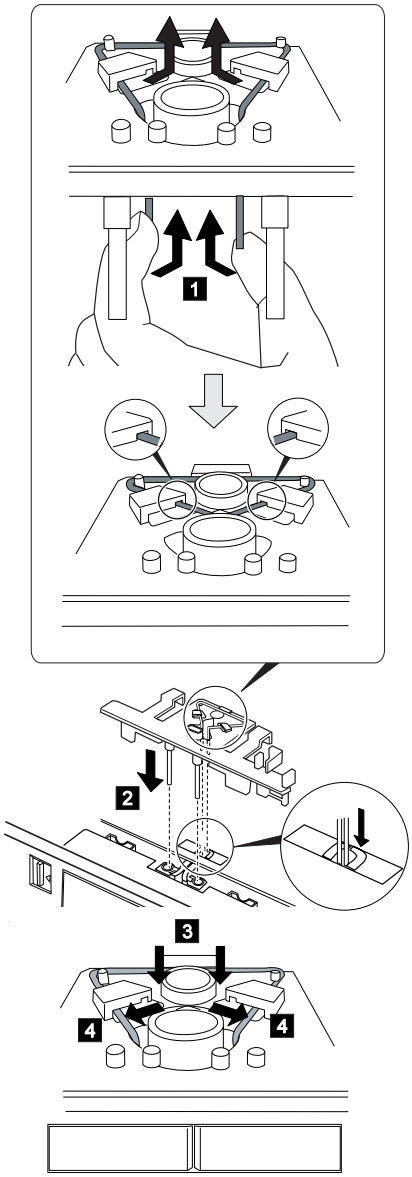
2. Follows the procedure shown in the figure. After replacing the eject lever assembly, make sure that the lever pops out.



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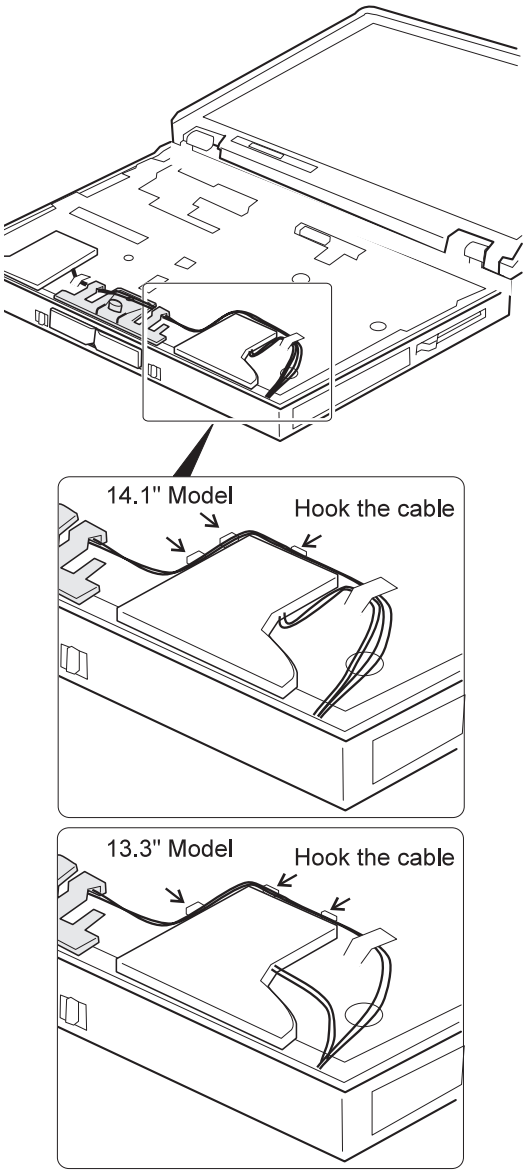
3. Following figure shows the speaker cable route.



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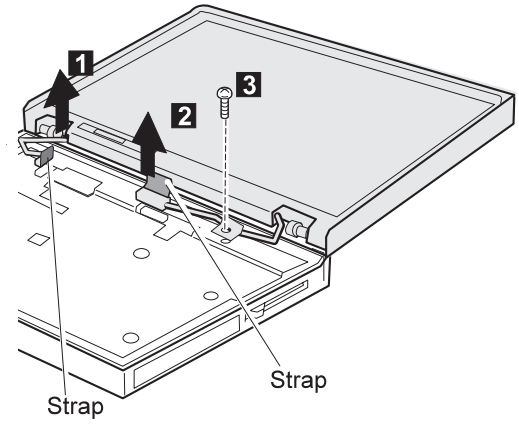
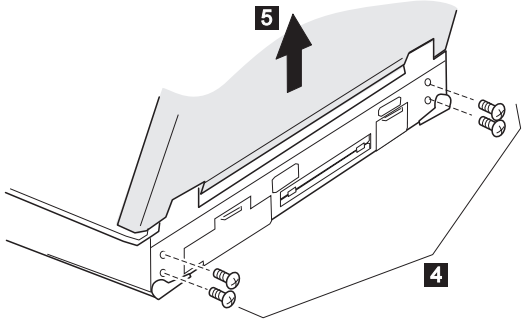
1090 LCD Unit

- Battery Pack **(1010)**
- UltraBay II Device or 2nd Battery Pack **(1020)**
- Keyboard Unit **(1060)**
- Hinge Cover and Center Cover **(1070)**

Pull the strap when disconnecting the connectors.





(Rear view)

Step	Size (Quantity)	Color	Torque
3	M2.5 x 4 mm, Nylon (1)	Yellow	4 kgcm
4	M2.5 x 6 mm, Nylon (4)	Black	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.			

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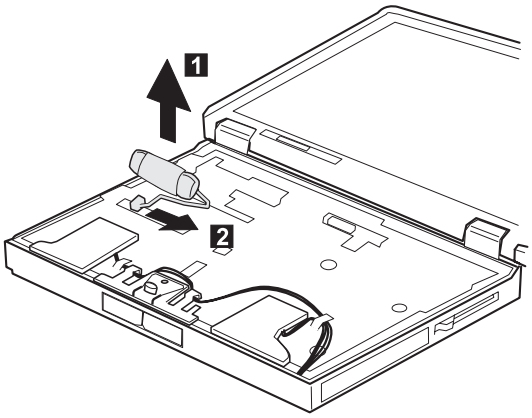
1100 Standby Battery

- Battery Pack **(1010)**
- UltraBay II Device or 2nd Battery Pack **(1020)**
- Keyboard Unit **(1060)**



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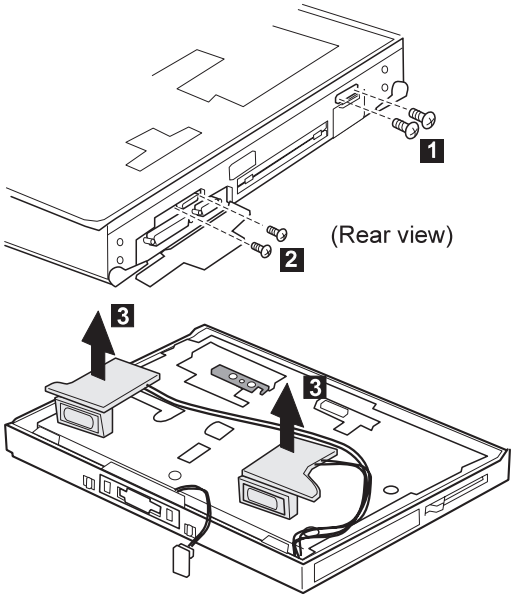
1110 Upper Shield

- Battery Pack **(1010)**
- UltraBay II Device or 2nd Battery Pack **(1020)**
- Keyboard Unit **(1060)**
- Hinge Cover and Center Cover **(1070)**
- Eject Lever and Power Switch **(1080)**
- LCD Unit **(1090)**
- Standby Battery **(1100)**



Step	Size (Quantity)	Color	Torque
1	M2.5 x 6 mm, Nylon (2)	Black	4 kgcm
2	M1.6 x 4 mm, flathead (2)	Black	2 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

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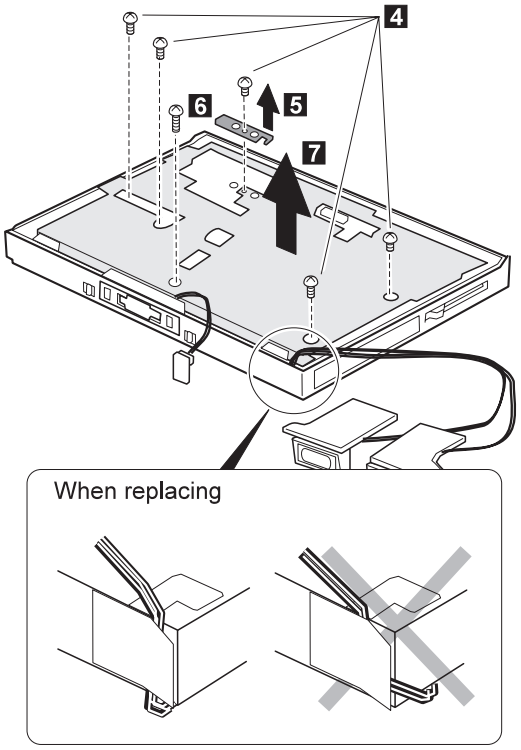

Step	Size (Quantity)	Color	Torque
4	M2.5 x 4 mm, Nylon (5)	Yellow	4 kgcm
6	M2.5 x 6 mm, Nylon (1)	Black	4 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

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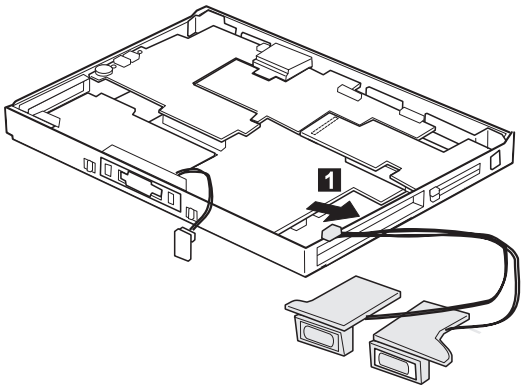
1120 Speaker

- Battery Pack **(1010)**
- UltraBay II Device or 2nd Battery Pack **(1020)**
- Keyboard Unit **(1060)**
- Hinge Cover and Center Cover **(1070)**
- Eject Lever and Power Switch **(1080)**
- LCD Unit **(1090)**
- Standby Battery **(1100)**
- Upper Shield **(1110)**



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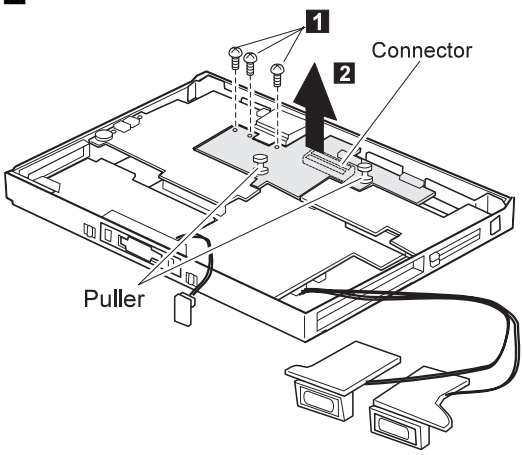
1130 Video Card

- Battery Pack **(1010)**
- UltraBay II Device or 2nd Battery Pack **(1020)**
- Keyboard Unit **(1060)**
- Hinge Cover and Center Cover **(1070)**
- Eject Lever and Power Switch **(1080)**
- LCD Unit **(1090)**
- Standby Battery **(1100)**
- Upper Shield **(1110)**

Pull the pullers on the card when removing the card in step **2**.



Step	Size (Quantity)	Color	Torque
1	M2.5 x 3 mm, Nylon (3)	Black	4 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

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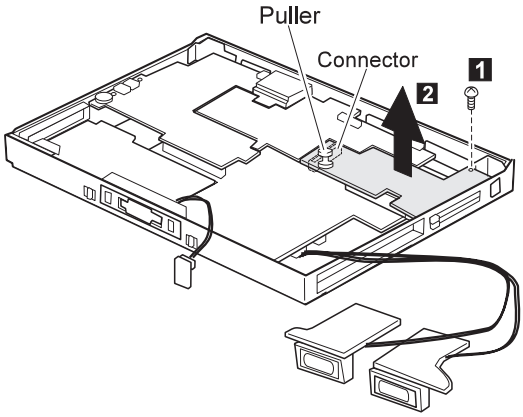
1140 Modem Card

- Battery Pack **(1010)**
- UltraBay II Device or 2nd Battery Pack **(1020)**
- Keyboard Unit **(1060)**
- Hinge Cover and Center Cover **(1070)**
- Eject Lever and Power Switch **(1080)**
- LCD Unit **(1090)**
- Standby Battery **(1100)**
- Upper Shield **(1110)**

Pull the pullers on the card when removing the card in step **2**.



Step	Size (Quantity)	Color	Torque
1	M2.5 x 3 mm, Nylon (1)	Black	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.			

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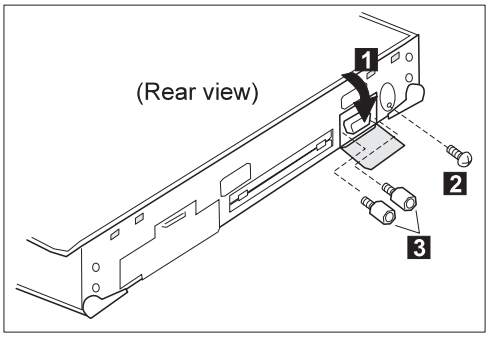
1150 DC/DC Card

- Battery Pack **(1010)**
- UltraBay II Device or 2nd Battery Pack **(1020)**
- Keyboard Unit **(1060)**
- Hinge Cover and Center Cover **(1070)**
- Eject Lever and Power Switch **(1080)**
- LCD Unit **(1090)**
- Standby Battery **(1100)**
- Upper Shield **(1110)**

Pull the pullers on the card when removing the card in step **6** .



Step	Size (Quantity)	Color	Torque
2	M2.5 x 6 mm, Nylon (1)	Black	4 kgcm
3	Hex head (2)	Self-tapping screw	4 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

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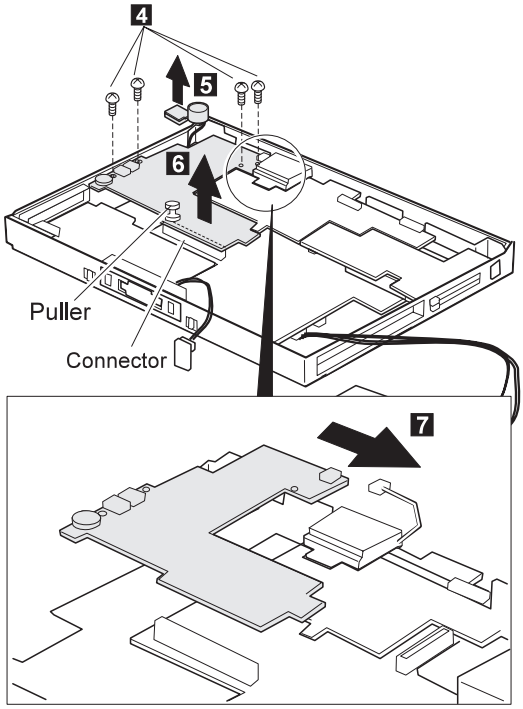

Step	Size (Quantity)	Color	Torque
4	M2.5 x 3 mm, Nylon (4)	Black	4 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

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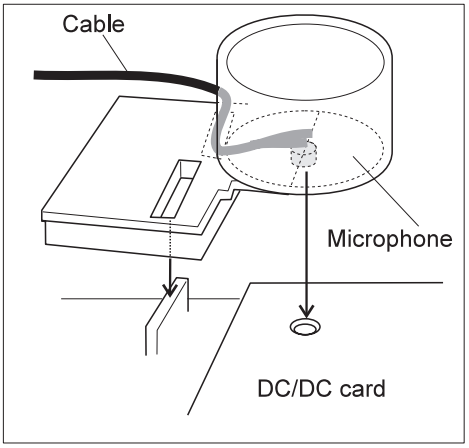
When replacing:

Locate the microphone and it's cable as shown in the figure.



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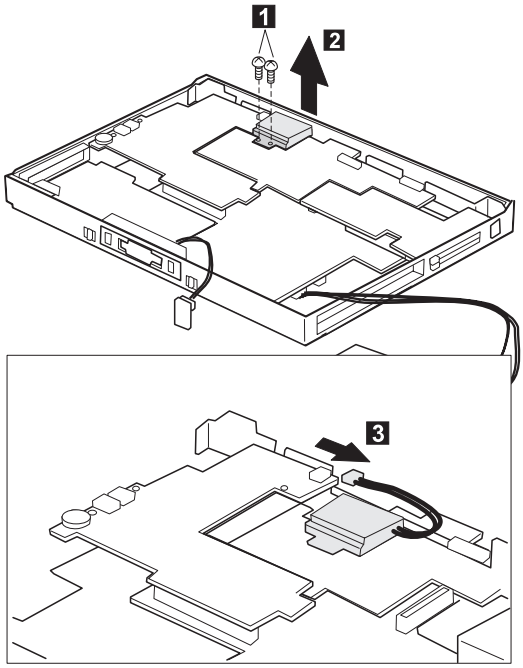
1160 Fan

- Battery Pack **(1010)**
- UltraBay II Device or 2nd Battery Pack **(1020)**
- Keyboard Unit **(1060)**
- Hinge Cover and Center Cover **(1070)**
- Eject Lever and Power Switch **(1080)**
- LCD Unit **(1090)**
- Standby Battery **(1100)**
- Upper Shield **(1110)**



Step	Size (Quantity)	Color	Torque
1	M2.5 x 6 mm, Nylon (2)	Black	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.			

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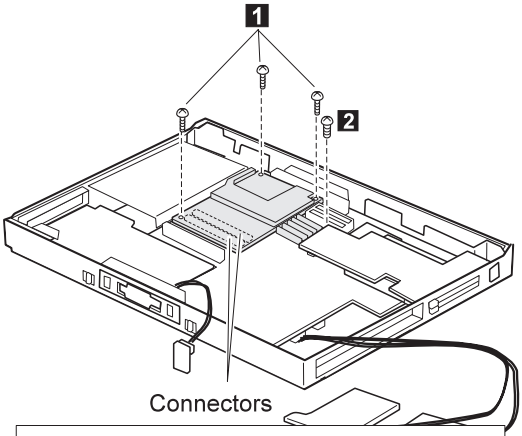
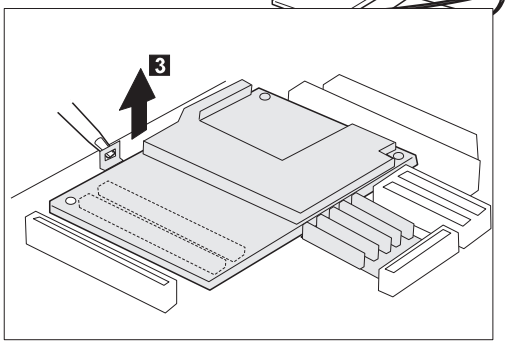
1170 CPU Card

- Battery Pack **(1010)**
- UltraBay II Device or 2nd Battery Pack **(1020)**
- Keyboard Unit **(1060)**
- Hinge Cover and Center Cover **(1070)**
- Eject Lever and Power Switch **(1080)**
- LCD Unit **(1090)**
- Standby Battery **(1100)**
- Upper Shield **(1110)**
- Video Card **(1130)**
- DC/DC Card **(1150)**
- Fan **(1160)**





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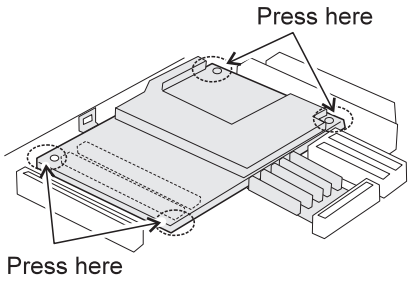
Attention

- When removing, be careful not to damage the CPU card.
- When replacing, make sure the card is connected firmly. **Press only the corners of the card, as shown.**



A loose connection or damage to the card causes the serious problem, such as not being able to powered on.

Step	Size (Quantity)	Color	Torque
1	M2 x 10 mm (3)	Yellow	2.5 kgcm
2	M2.5 x 4 mm, Nylon (1)	Yellow	4 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

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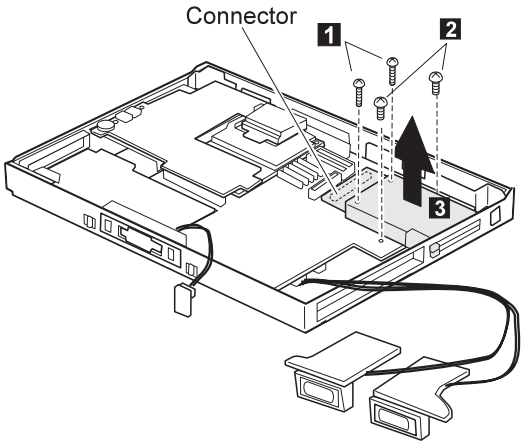
1180 PC Card Slot

- Battery Pack **(1010)**
- UltraBay II Device or 2nd Battery Pack **(1020)**
- Keyboard Unit **(1060)**
- Hinge Cover and Center Cover **(1070)**
- Eject Lever and Power Switch **(1080)**
- LCD Unit **(1090)**
- Standby Battery **(1100)**
- Upper Shield **(1110)**
- Video Card **(1130)**
- Modem Card **(1140)**



Note: When removing the PC Card slot, make sure that the PC Card eject buttons do not pop out.

Step	Size (Quantity)	Color	Torque
1	M2 x 14 mm (2)	Yellow	2.5 kgcm
2	M2.5 x 4 mm, Nylon (2)	Yellow	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.			

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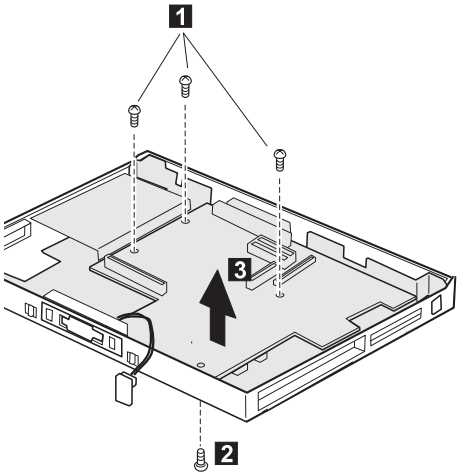
1190 System Board

- Battery Pack **(1010)**
- UltraBay II Device or 2nd Battery Pack **(1020)**
- Hard Disk Drive **(1040)**
- Keyboard Unit **(1060)**
- Hinge Cover and Center Cover **(1070)**
- Eject Lever and Power Switch **(1080)**
- LCD Unit **(1090)**
- Standby Battery **(1100)**
- Upper Shield **(1110)**
- Video Card **(1130)**
- Modem Card **(1140)**
- DC/DC Card **(1150)**
- Fan **(1160)**
- CPU Card **(1170)**
- PC Card Slot **(1180)**



Step	Size (Quantity)	Color	Torque
1	M2.5 x 4 mm, Nylon (3)	Yellow	4 kgcm
2	M2.5 x 6 mm, Nylon (1)	Black	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.			

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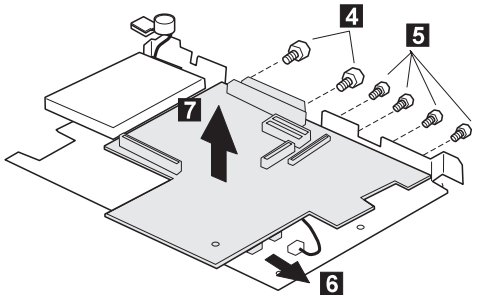
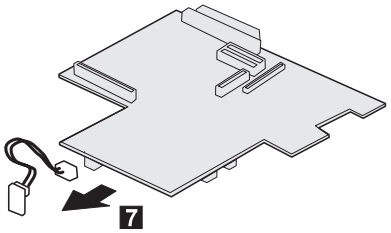


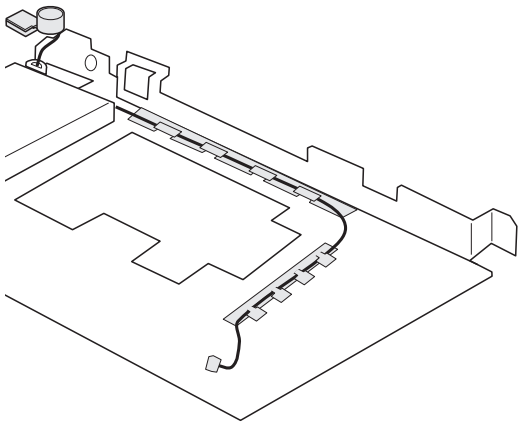
Step	Size (Quantity)	Color	Torque
4	5.5, X' (2)	Self-tapping screw	4 kgcm
5	5, X' (4)	Self-tapping screw	4 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.



Microphone cable route:

See the following figure for the microphone cable route.



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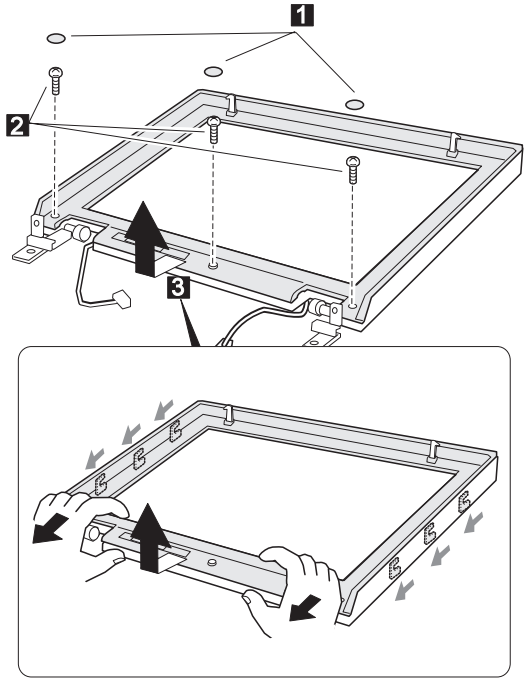
2010 LCD Front Cover

- Battery Pack **(1010)**
- UltraBay II Device or 2nd Battery Pack **(1020)**
- Keyboard Unit **(1060)**
- Hinge Cover and Center Cover **(1070)**
- LCD Unit **(1090)**



Step	Size (Quantity)	Color	Torque
2	M2.5 x 6 mm, Nylon (3)	Black	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.			

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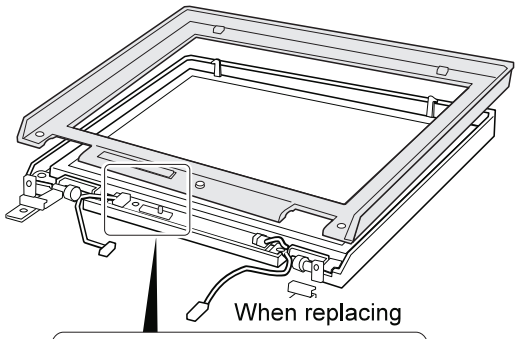
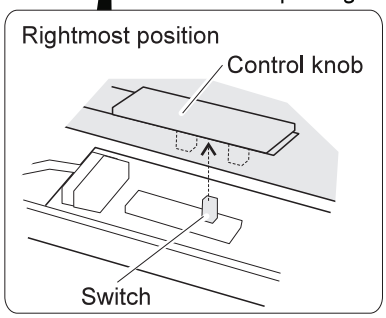
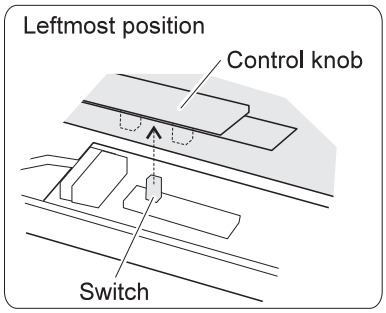
When replacing:

Align the LCD front-cover control knob and inverter-card switch to either the leftmost or the rightmost position, so that they engage easily, as shown. After replacing the LCD front cover, make sure that the control knob works correctly.







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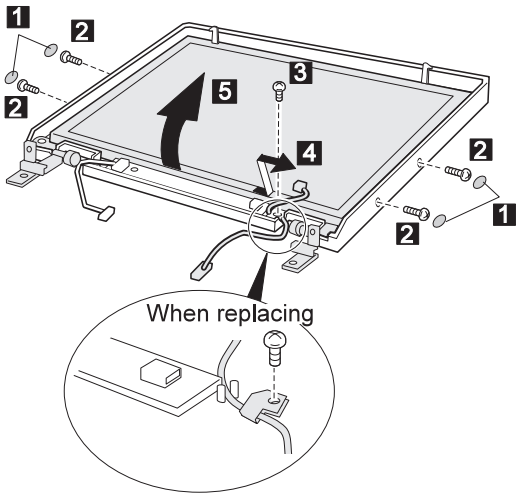
2020 LCD Panel Assembly

- Battery Pack **(1010)**
- UltraBay II Device or 2nd Battery Pack **(1020)**
- Keyboard Unit **(1060)**
- Hinge Cover and Center Cover **(1070)**
- LCD Unit **(1090)**
- LCD Front Cover **(2010)**

14.1" LCD



Step	Size (Quantity)	Color	Torque
2	M2.5 x 6 mm, Nylon (4)	Black	4 kgcm
3	M2.5 x 4 mm, Nylon (1)	Yellow	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.			

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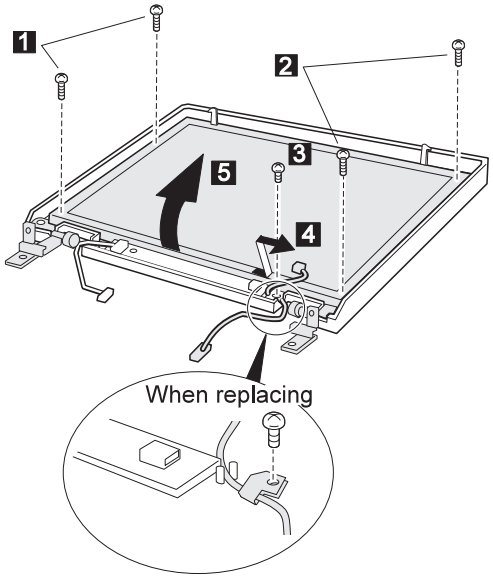
13.3" LCD



Step	Size (Quantity)	Color	Torque
1	M2.5 x 4 mm, Nylon (2)	Black	4 kgcm
2	M2.5 x 6 mm, Nylon (2)	Black	4 kgcm
3	M2.5 x 4 mm, Nylon (1)	Yellow	4 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

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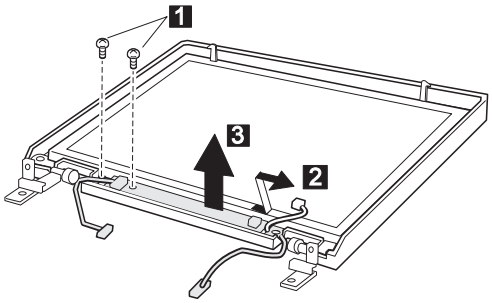
2030 Inverter Card

- Battery Pack **(1010)**
- UltraBay II Device or 2nd Battery Pack **(1020)**
- Keyboard Unit **(1060)**
- Hinge Cover and Center Cover **(1070)**
- LCD Unit **(1090)**
- LCD Front Cover **(2010)**



Step	Size (Quantity)	Color	Torque
1	M2.5 x 4 mm, Nylon (2)	Yellow	4 kgcm
Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.			

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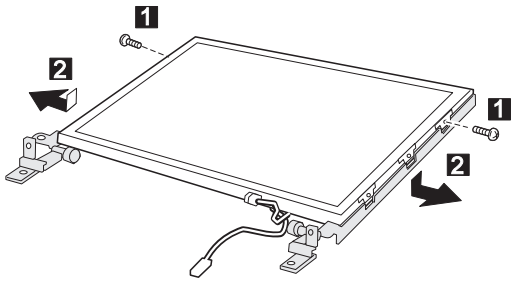
2050 Hinge and LCD Latch

- Battery Pack **(1010)**
- UltraBay II Device or 2nd Battery Pack **(1020)**
- Keyboard Unit **(1060)**
- Hinge Cover and Center Cover **(1070)**
- LCD Unit **(1090)**
- LCD Front Cover **(2010)**
- Inverter Card **(2030)**

Attention

Make sure you use the correct screw when replacing. A wrong-size screw will damage the LCD panel.



When replacing:

Make sure the connector is not loosen.

Step	Size (Quantity)	Color	Torque
1	M2.5 x 4 mm (2)	Yellow	4 kgcm

Note: Make sure you use the correct screw and tighten the screw to the torque specified. Do not use the screw that you removed, use a new screw.

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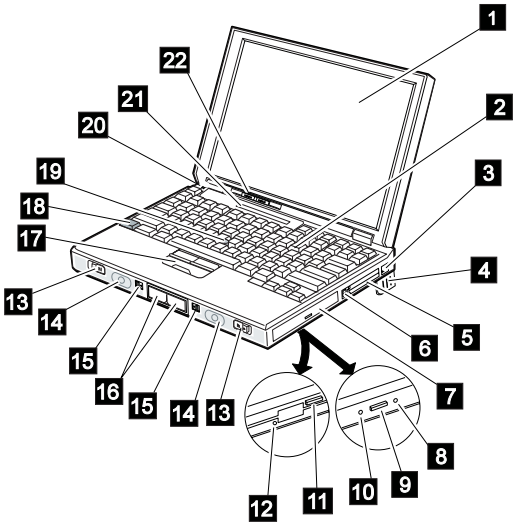
Locations

Front View

1 LCD
2 Numeric keypad
3 Internal modem port
4 Legs
5 PC Card slots
6 PC Card eject button
7 UltraBay II
8 Emergency eject hole
9 Eject button
10 Drive-in-use indicator
11 Diskette eject button
12 Diskette drive-in-use indicator
13 Cover release latches
14 Stereo speakers
15 Release latches
16 Bay eject lever
17 Click buttons
18 **Fn** key
19 TrackPoint
20 Built-in microphone
21 Indicator panel
22 Brightness control knob



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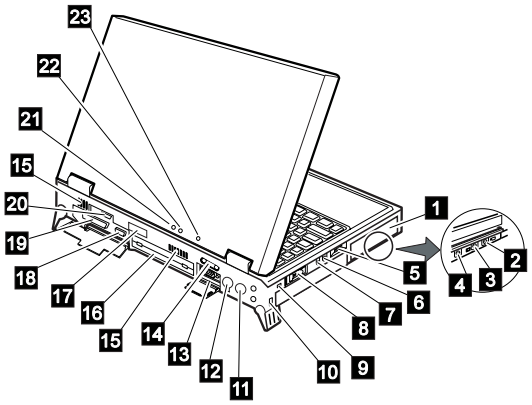
Rear View

1. Battery pack
2. Video in port
3. Video out port
4. Dolby Digital Output port
5. Volume control
6. Microphone/line-in jack
7. Headphone jack
8. Power switch
9. Reset switch
10. Security keyhole
11. AC power jack
12. External input device port
13. Serial port
14. Universal serial (USB) port
15. Fan louvers
16. System expansion port
17. Rear infrared port
18. External display port
19. Parallel port
20. External diskette drive
21. Power-on indicator
22. Suspend indicator
23. Charge indicator

Note

If the DVD and Enhanced Video Adapter is used, 1, 2, 3 are available.



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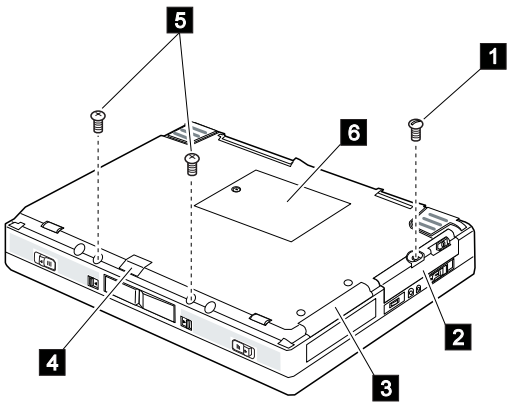
Bottom View

1. Coin screw or security screw
2. Hard disk drive
3. DVD adapter card slot
4. Front infrared port
5. Security screws
6. DIMM slot



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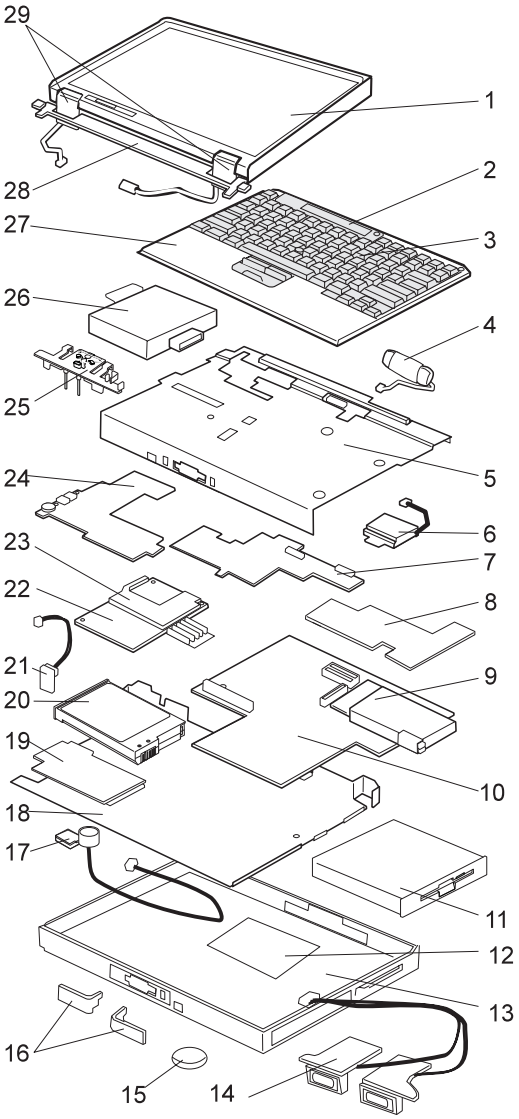
Parts Listing 770 (9548, 9549)

Model 770



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Index	*Part*	
1	LCD Assembly (*See LCD FRU*)	
2	Indicator Panel	12J0448
3	Keyboard *(See Keyboard Section)*	
4	Standby Battery	12J0428
5	Upper Shield Case	05K4468
6	Fan	05K4469
7	Video Card	12J0410
8	Modem Card	12J0412
9	PC Card Slots Assembly	05K4475
10	System Board	10L1574
11	FDD Assembly	12J0425
12	DIMM Cover	12J0421
13	Base Cover	
	For 14.1" model	12J0401
	For 13.3" model	12J0402
14	Stereo Speaker Assembly	
	For 14.1" model	12J0415
	Korea model	05K4569
	For 13.3" model	12J2001
	Korea model	05K4570
15	Backup Battery	12J0453
16	Eject Lever *(See Mech. Group)*	
17	Microphone Assembly (with holder)	05K4476
18	Lower Shield Case	12J0407
19	DVD Card	12J0411
20	Battery Pack (Lithium-Ion)	12J0433
21	LED Card	05K4460
22	CPU Card (200 MHz Pentium /L2 512)	12J0409
	CPU Card (233 MHz Pentium /L2 512)	12J0408
23	Heat Sink	12J0414
24	DC/DC Card	12J0413
25	Eject Holder Asm.*(See Mech. Group)*	
26	Hard Disk Drive (3.2 GB)	12J0427
	Hard Disk Drive (4 GB)	12J0426
	Hard Disk Drive (5.1 GB)	12J0449
27	Keyboard Bezel	
	For 14.1" model	12J0416
	Korea model	05K4571
	For 13.3" model	12J0417
	Korea model	05K4572
28	Center Cover	12J0422
29	Hinge Cap (Right and Left)	12J0423

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AC Adapter (56W)	11J8956
For Japan	11J8974
Enhanced Video Cable	85G1897
FDD Cable	12J0432
Flap Bus Connector	05K4471
Foot	05K4472
HDD Door	05K4473
I/O Door (Left)	12J0419
I/O Door (Right)	12J0420
PC Card Lid	05K4470
TrackPoint Cap	84G6536
USB/Parallel Wrap Cable	05K2580
Security & Coin Screw	05K4477
Includes the following:	
Security Screw (3)	
Coin Screw (1)	
Logic Miscellaneous Parts	12J0406
Includes the following:	
M5 Nut Bus Connector	
Screw Cap	
Base Miscellaneous Parts	12J0429
Includes the following:	
Blank Cover Adv. MM Adapter	
Blank Lid for RJ11	
EMI Finger-LCD Icon	
Keyboard Spacer	
Keyboard Washer	
Power Switch	
Screw Cap	
Spacer for Non-Modem Model	
Mechanical Group	
For 14.1" model	12J0403
For 13.3" model	12J0404
Includes the following:	
Eject Lever (Right and Left)	
Eject Holder Assembly	

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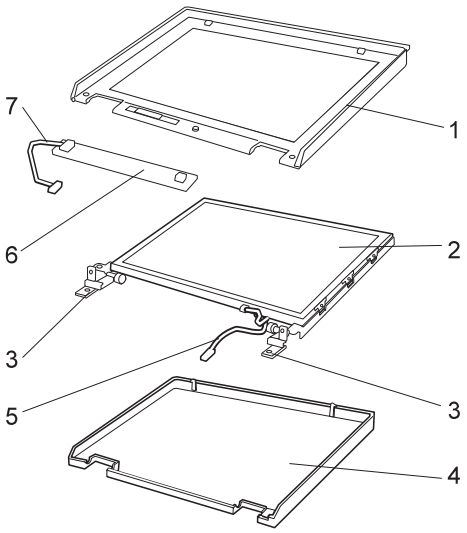
LCD FRU



Index	*Part*	
1	LCD Front Cover	
	For 14.1" model	12J0446
	For 13.3" model	12J0447
2	LCD Panel	
	For 14.1" model	12J0438
	For 13.3" model	12J0439
3	Hinge (Right and Left)	
	For 14.1" model	12J0436
	For 13.3" model	12J0437
4	LCD Rear Cover	
	For 14.1" model	12J0434
	Korea model	05K4573
	For 13.3" model	12J0435
	Korea model	05K4574
5	LCD Cable	12J0440
6	Inverter	
	For 14.1" model	12J0444
	For 13.3" model	12J0445
7	Inverter Cable	12J0441

LCD Miscellaneous Parts for 14.1" Model	12J0442
LCD Miscellaneous Parts for 13.3" Model	12J0443

Includes the following:
Control Knob
Latch (Right and Left)
Screw Cap

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Keyboard Unit

Canadian French	12J2009
Danish	12J2021
Dutch	12J2015
French	12J2013
German	12J2011
Italian	12J2023
Japanese	12J2007
Korean	02K4315
Latin American Spanish	02K4313
Norwegian	12J2019
Portuguese	12J2031
Spanish	12J2025
Swedish or Finnish	12J2017
Swiss	12J2027
U.K. English	12J2006
U.S. English	12J2005

Common and Option Parts List

Miscellaneous Parts

Screw Kit	05K4478
Includes the following:	
M1.6 x 4mm (2)	
M2.5 x 3mm, &nylon2. (8)	
M2.5 x 4mm, &nylon2. (23)	
M2.5 x 4mm, flat, Nylon (2)	
M2.5 x 6mm, &nylon2. (29)	
M2.5 x 8mm, &nylon2. (5)	
M2 x 4mm (2)	
M2 x 10mm (3)	
M2 x 14mm (2)	
M5 X' (2)	
Hex Stud D-sub (6)	
Security Screw (3)	
Coin Screw (1)	
Screw Cap	

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PSTN Cable

Austria	58G4386
Australia	58G4343
Belgium	58G4346
Denmark	58G4333
Finland	58G4334
France	58G4335
Germany	58G4347
U.S., Thailand, Malaysia, Singapore, and Hong Kong	43G3398
Netherlands	58G4340
New Zealand and PRC (other than Hong Kong)	58G4332
Norway	58G4334
Sweden	58G4336
Switzerland	58G4348
U.K.	58G4345

Options

Notes:

1. When you replace the AC Adapter or the Quick Charger, use the one for the country you are in, even if the computer is from a different country.
2. The warranty for the system unit does not apply to all options.

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810 MB Hard Disk Drive Assembly	29H9366
1.08 GB Hard Disk Drive Assembly	29H9367
1.2 GB Hard Disk Drive Assembly	29H9228
1.4 GB Hard Disk Drive Assembly	82H8884
2.1 GB Hard Disk Drive Assembly	82H8489
3 GB Hard Disk Drive Assembly	45H8791
CD-ROM Drive	12J0424
DVD Drive	11J8952
Display Stand	39H7448
Battery Spacer for UltraBay II	11J8968
2nd HDD Adapter, Main Flame	11J8941
2nd HDD Adapter for HDD Model 770	11J8942
2nd HDD Adapter for HDD Model 760	11J8943
SelectaBase 770	11J8822
PC Card Enabler	11J8823
Conversion Cable (Game Port)	29G9269
Conversion Cable (Video)	85G1897
Headset	85G1529
Interface Cable to System for Keyboard	84G2531
Interface Cable to Keyboard for Keypad	84G2532
Mini-DIN to Mini-DIN Cable	84G6474
PCMCIA Cartridge	84G1303
PCMCIA RF Cartridge	84G1304
PS/2 Miniature Mouse	95F5723
Wall Plug	85G2367
SO-DIMM 8 MB	42H2767
SO-DIMM 16 MB	42H2768
SO-DIMM 32 MB	42H2769
SO-DIMM 64 MB	42H2817
SO-DIMM (SDRAM) 16 MB	42H2818
SO-DIMM (SDARM) 32 MB	42H2819
SO-DIMM (SDRAM) 64 MB	42H2820

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Numeric Keypad

Belgian	95F5741
Canadian French	95F5466
Danish	95F5467
Dutch	95F5467
French	95F6313
German	95F6314
Greek	95F5467
Hebrew	95F5741
Icelandic	95F5467
Italian	95F6316
Japanese	79F6401
Norwegian	95F5467
Spanish	95F6315
Swedish or Finnish	95F5468
Swiss (French)	95F5711
Swiss (German)	95F5715
Turkish	95F5467
U.K. English	95F5741
U.S. English	95F5741

Black Keypad

French	84G6286
German	84G6280
Italian	84G6292
Norwegian	84G6310
Swedish	84G6304
U.K. English	84G6298
U.S. English	84G2530

Black Keyboard

French	84G6285
German	84G6279
Italian	84G6291
Norwegian	84G6309
Swedish	84G6303
U.K. English	84G6297
U.S. English	84G2529

Accessories

Keyboard/Mouse Cable	54G0444

Tools

Tri-Connector Wrap Plug	72X8546
PC Test Card	35G4703
Audio Wrap Cable	66G5180
Screwdriver Kit	95F3598
ThinkPad Hardware Maintenance Diskette Version 1.40	05L1738
USB-Parallel Connector	05K2586

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Power Cords

IBM power cords for a specific country are usually available only in that country:

- For 2-pin power cords:

IBM Power Cord Part Number	Used in These Countries
13H5264	Bahamas, Barbados, Bermuda, Bolivia, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Korea (South), Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Thailand, Trinidad (West Indies), United States of America, Venezuela
13H5267	Abu Dhabi, Albania, Antigua, Bahrain, Brunei, Dubai, Fiji, India, Ireland, Kenya, Kuwait, Macao, Malaysia, Nigeria, Oman, People's Republic of China (includes Hong Kong), Qatar, Singapore, United Kingdom
13H5270	Austria, Belgium, Bulgaria, Chile, Czech Republic, Denmark, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Israel, Italy, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Switzerland, Turkey, former Yugoslavia
13H5273	Japan
13H5276	Argentina, Australia, New Zealand, Papua New Guinea, Paraguay, Uruguay
13H5279	Bangladesh, Pakistan, South Africa, Sri Lanka

- For 3-pin power cords:

Note

The grounded adapter is required for full MPRII compliance.

IBM Power Cord Part Number	Used in These Countries
76H3514	Argentina, Australia, Papua New Guinea, New Zealand, Paraguay, Uruguay

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IBM Power Cord Part Number	Used in These Countries
76H3516	Bahamas, Barbados, Bermuda, Bolivia, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Trinidad (West Indies), Thailand, United States of America, Venezuela
76H3518	Austria, Belgium, Bulgaria, Czech Republic, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Turkey, former Yugoslavia
76H3520	Denmark
76H3522	Bangladesh, Pakistan, South Africa, Sri Lanka
76H3524	Abu Dhabi, Albania, Antigua, Bahrain, Brunei, Dubai, Fiji, India, Ireland, Kenya, Kuwait, Macao, Malaysia, Nigeria, Oman, People's Republic of China (includes Hong Kong), Qatar, Singapore, United Kingdom
76H3526	Japan
76H3528	Switzerland, Liechtenstein
76H3530	Chile, Ethiopia, Italy, Libya
76H3532	Israel
76H3535	Korea

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Read This First

Before you go to the checkout guide, be sure to read this section.

Important Notes

- **Only certified trained personnel should service the computer**.
- Read FRU service procedures before replacing any FRUs.
- **Be extremely careful during write operations such as copying, saving, or formatting.** Drives in the computer that you are servicing might have been rearranged; or the drive startup sequence might have been altered. If you select an incorrect drive, data or programs can be overwritten.
- **Replace FRUs only for the correct model.** When you replace the FRU, make sure the model of the machine and FRU part number are correct by referring to the part list.
- **FRUs should not be replaced because of a single, unreproducible failure.** A single failure can occur from a variety of reasons that have nothing to do with a hardware defect; such as: cosmic radiation, electrostatic discharge, or software errors. FRU replacement should be considered only for a recurring problem. If you suspect an unreproducible failure, clear the error log and run the test again. Do not replace any FRUs if the error log did not reappear.
- **Be careful not to replace a nondefective FRU.**

How to Use Error Messages: Use the error codes displayed on the screen to diagnose failures. If more than one error code is displayed, begin the diagnosis with the first error code. If no error code is displayed, see if the error symptom is listed in the “Symptom-to-FRU Index” on page 640.

How to Diagnose Multiple FRUs: If the adapter or device has more than one FRU, the error code could be caused by either FRU. Before replacing multiple FRUs, try removing or exchanging each FRU, one by one in the designated sequence, to see if the symptoms change.

What to Do First: The servicer must include the following in the parts exchange form or parts return form that is attached to the returned FRU.

___ 1. Name and phone number of servicer.
___ 2. Date of service.
___ 3. Date when part failed.
___ 4. Date of purchase.

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___ 5. Failure symptoms, error codes appearing on the display, and beep symptoms.
___ 6. Procedure index and page number in which failing FRU was detected.
___ 7. Failing FRU name and part number.
___ 8. Machine type, model number, and serial number.
___ 9. Customer's name and address.

Before checking problems with the computer, refer to the following to determine whether the damage applies the warranty:

Note for Warranty: During the warranty period, the customer may be responsible for repair costs if the computer damage was caused by misuse, accident, modification, unsuitable physical or operating environment, or improper maintenance by the customer. The following list provides some common items that are not covered under warranty and some symptoms that may indicate the system was subjected to stress beyond normal use:

The following is not covered under warranty:

- Scratched (cosmetic) parts.
- Cracked or broken plastic parts, broken latches, broken pins, or broken connectors caused by excessive force.
- Damage caused by liquid spilled into the system.
- Damage caused by improperly inserting a PC Card or installation of an incompatible card.
- Damage caused by a foreign material in the UltraBay II or the device space bay.
- Diskette drive damage caused by pressing the diskette drive cover or inserting a diskette with multiple labels.
- Damaged or bent diskette eject button.
- CD-ROM drive damage caused by excessive force, shock, or by being dropped.
- Fuses blown by attaching a nonsupported device.
- Forgotten a computer or a hard disk password (making computer or hard disk unusable).

If the following symptoms are present, they may indicate damage caused by nonwarranted activities:

- Missing parts may be a symptom of unauthorized service or a modification.
- HDD spindles can become noisy if subjected to excessive force or by being dropped.
- I9990303 errors can be caused by exposure to strong magnetic fields.

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General Preparation

Note: In this manual, *port replicator* means the SelectaDock Base Model I or SelectaBase 770. *SelectaDock* means the SelectaDock III and the *SelectaDock Docking System* means the port replicator and SelectaDock when docked together as one unit.

1. The SelectaDock III supports the ThinkPad 760E, 760ED, 760EL, 760ELD, 760XD, 760XL, 765D, 765L, and 770. When any other model is docked to the SelectaDock III, a beep sounds. Check which model of the ThinkPad is docked to the SelectaDock III before maintenance.
2. Check that the port replicator is correctly docked (connected) to the SelectaDock III.
3. Check that the computer is correctly docked (connected) to the SelectaDock Docking System.
4. Dock a computer to the port replicator has no problem. If there is any problem with the SelectaDock Docking System, replace the port replicator.
5. If possible, make sure that there are no hardware setting conflicts, such as interrupt levels, memory addresses, DMA channels, and I/O addresses.
6. If the PCI or the ISA card is installed, check that the card is supported by the computer.
7. Check that the SCSI ID is set correctly.
8. Test and correct any computer problems before you test it with the SelectaDock Docking System. Use the computer documentation to resolve any computer problems.
9. Test the computer with the external keyboard, external monitor, mouse, and parallel and serial device connectors. (Use the keyboard/mouse connector to test the external keyboard and mouse.) If no problems are found, connect the external keyboard, mouse, parallel and serial devices to the SelectaDock Docking System. Then connect the SelectaDock Docking System to the computer and test it.
10. If external devices are attached to the SelectaDock Docking System, such as an audio amplifier, check the device by referring to the manual shipped with it.
11. If the user did not bring the computer with a SelectaDock Docking System when service is needed, use a computer that works correctly with the SelectaDock Docking System.

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Checkout Guide

Use the following procedure as a guide for computer problems.

Note: The diagnostic tests are intended to test only IBM products. Non-IBM products, prototype cards, or modified options can give false errors and invalid system responses.

Important

When the problem determination procedure in the operation manual that is supplied with the adapter or device says "Have the system unit serviced," this means both the computer and the SelectaDock Docking System.

1. Obtain the failing symptoms in as much detail as possible.
2. Verify the symptoms by attempting to re-create the failure by running the diagnostic test or by repeating the same operation.

   Note: To run the diagnostics, refer to the diagnostics section of of the computer you are servicing.
3. Use the following table with the verified symptom to determine which page to go to. Search the symptoms column and find the description that best matches your symptom; then go to the page shown in the "Go to" column.

Symptoms (Verified)	Go to
Power failure. (The power indicator does not go on or stay on.)	"Power Supply" on page 626.
POST does not complete. No beeps or error code are indicated.	"Symptom-to-FRU Index" on page 640.
The configuration is not the same as the installed devices.	"Checking the Installed Devices List" on page 628
POST beeps, but no error codes are displayed.	"Symptom-to-FRU Index" on page 640, and then go to "Beep Symptoms" on page 647.
POST detected an error and displayed numeric error codes.	"Symptom-to-FRU Index" on page 640, and then go to "Numeric Error Codes" on page 641.
The diagnostic test detected an error and displayed a FRU code.	"Diagnostic Error Codes" on page 643.

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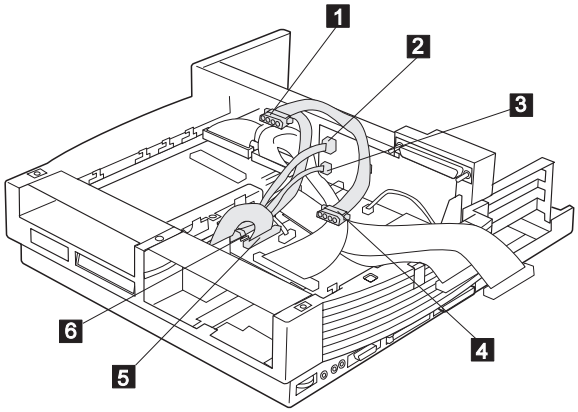
Symptoms (Verified)	Go to
Other symptoms (such as LCD indicator problems).	"Symptom-to-FRU Index" on page 640, and then go to "Other Symptoms" on page 652.
Symptoms cannot be re-created (intermittent problems).	Use the customer reported symptoms and go to "Symptom-to-FRU Index" on page 640.

Power Supply

If the power-on indicator is not on and the power supply fan is not turning, check the power cord for continuity and correct installation.

If the power cord is not the problem, either the power supply is defective, or another component is defective causing the power supply to cut off. To verify that the power supply is operating correctly, do the following:

1. Turn off the computer and disconnect the SelectaDock III power cord.
2. Remove all internal devices, external devices, and the computer from the SelectaDock Docking System.
3. Undock the port replicator.
4. Remove the device space bay frame (see "1050 Device Space Bay Frame" on page 661).
5. Remove connectors 1, 2, 3, 4, 5, and 6 from the each device, tray, or card.



6. To power on the power supply, on connector 5, short-circuit pins 2 and 8, and with a 15-ohm resistor short-circuit pins 1 and 15. Then check the power supply voltages on each connector.

If any of the voltages is not correct, replace the power supply. If replacing the power supply does not correct the

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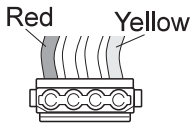
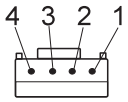
problem, reinstall the original power supply, and replace the main card.

Power Supply Connector 1 and 4



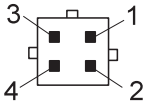
Pin	V dc
Red cord	+ 5 V
Yellow cord	+ 12 V

Power Supply Connector 2



Pin	Signal	V dc Min.	V dc Max.
1, 2	CVCC	+ 19 V	+ 21 V
3, 4	GND	–	–

Power Supply Connector 3



Pin	Signal	V dc Min.	V dc Max.
1	– 12 V	– 11.4 V	– 13.2 V
2, 3	GND	–	–
4	– 5 V	– 4.53 V	– 5.5 V

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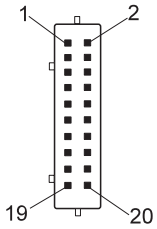
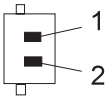
Power Supply Connector 5



Pin	Signal	V dc Min.	V dc Max.
1	VCC-off	+2.0 V	+4.5 V
2, 3	GND	—	—
4	SUB 12 V	+11.4 V	+12.6 V
5	GND	—	—
6, 7	+12 V	+11.4 V	+12.6 V
8	GND	—	—
9—11	+3.3 V	+3.0 V	+3.6 V
12—14	GND	—	—
15—17	+5 V	+4.75 V	+5.25 V
18—20	GND	—	—

Power Supply Connector 6



Pin	Signal	V dc Min.	V dc Max.
1 (red)	Fan off	0 V	+0.5 V
2 (black)	GND	—	—

Checking the Installed Devices List

If a device is installed but the icon appears in a gray shade rather than a dark shade on the basic diagnostics screen, the device is defective. Reseat the device connectors. If the symptom remains, replace the device or the system board of the computer. If needed, adjust the contrast control to clearly distinguish the shades of the icon.

If a device that is not installed appears in a dark shade (for example, FDD-2 appears in a dark shade when *no* second FDD is installed), do the following:

1. Replace the **first** device in the configuration, such as an FDD-1 and an HDD-1.
2. If the problem remains, replace the system board of the computer.

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The PCMCIA-1, parallel, and serial icons are always displayed in a dark shade, because the icons represent subsystems of the system board and not the attachment of the devices.

The FDD-1, the HDD-1, the PCMCIA-1, the CD ROM-1, or the DVD-1 icons represent the **first** drive in the system configuration for each type of device. Similarly, the HDD-3, FDD-2, or PCMCIA-2 icons represent the **second** drive, usually attached through a port replicator or an expansion unit.

The HDD-2 icon represents the hard disk drive in the UltraBay of the computer. The HDD-3 or HDD-4 icons represent the hard disk drive in the SelectaDock III (except the SCSI hard disk). The FDD-2 or PCMCIA-2 icons represent the FDD or PCMCIA attached through a port replicator or in the SelectaDock III.

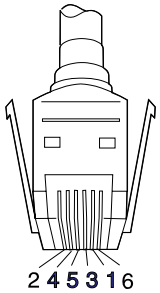
External Keyboard

Notes

- If a mouse or other pointing device is attached, remove it. If the error symptom goes away, the mouse or other pointing device is defective.
- The computer keyboard does not work when an external keyboard is connected.

1. Turn off the computer.
2. Disconnect the keyboard cable from the external keyboard.
3. Turn on the computer and check the keyboard cable connector for the following voltages. All voltages have a ±5% voltage tolerance.

Pin	Voltage (V dc)
1	+5.0
2	Not used
3	Ground
4	+5.0
5	+5.0
6	Not used



4. If all voltages are correct, replace the external keyboard.
5. If the voltages are not correct, replace the following FRUs one at a time until the problem is corrected.

   Note: If the replaced parts did not resolve the problem, put the original parts back in the SelectaDock Docking System. Do not replace nondefective parts.

   a. Keyboard cable.

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b. Port replicator.
c. System board of the computer.

External Monitor

If the screen is rolling, replace the external monitor.
If the problem is not corrected, replace FRUs in the following order one at a time until the problem is corrected:

Note: If the replaced parts did not resolve the problem, put the original parts back in the SelectaDock Docking System. Do not replace nondefective parts.

- If the external monitor is attached to the SelectaDock Docking System:
  1. Main card.
- If the external monitor is attached to the display adapter card:
  1. Display adapter card.
  2. Main card.
  3. Riser card.

If the screen is not rolling, do the following to run the display self-test:

1. Turn off the computer on the SelectaDock Docking System and the external monitor.
2. Disconnect the external monitor signal cable from the SelectaDock Docking System.
3. Turn on the external monitor.
4. Turn the contrast control to its maximum position.
5. Turn the brightness control to its center detect position.

Check for the following conditions:

- The screen should be white or light gray, with a black margin. See the appropriate display manuals for the correct self-test condition.
- The screen contrast and brightness controls should change the intensity of the screen.

If the external monitor does not meet these specifications, replace the external monitor.

If the external monitor meets these specifications, replace FRUs in the following order one at a time until the problem is corrected:

Note: If the replaced parts did not resolve the problem, put the original parts back in the SelectaDock Docking System. Do not replace nondefective parts.

- If the external monitor is attached to the SelectaDock Docking System:
  1. Main card.
  2. External monitor.

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- If the external monitor is attached to the display adapter card:
  1. Display adapter card.
  2. Main card.
  3. Riser card.
  4. External monitor.

Printer

Test the printer by connecting it to the computer before testing it on the SelectaDock Docking System.

1. Make sure the printer is correctly connected and the power is turned on.
2. Run the printer self-test.

If the printer self-test does not run correctly, the problem is in the printer. Refer to the printer service manual.

If the printer self-test runs correctly, connect the Tri-Connector wrap plug (P/N 72X8546) on the parallel connector of the computer, and run the advanced diagnostic tests to determine the failing FRU.

If the advanced diagnostic tests (with the wrap plug connected) did not detect a failure, replace the printer cable.

If the diagnostic detected the error, replace the system board of the computer.

- If the printer is attached to the parallel connector of the SelectaDock Docking System, replace the port replicator of the SelectaDock Docking System.
- If the printer is attached to the parallel connector on the adapter, replace the FRUs in the following order one at a time until the problem is corrected:

  Note: If the replaced parts did not resolve the problem, put the original parts back in the SelectaDock Docking System. Do not replace nondefective parts.

  1. Adapter.
  2. Main card.

USB Device

Test the USB (universal serial bus) device by connecting it to the computer before testing it on the SelectaDock Docking System.

1. Make sure the USB device is correctly connected and the power is turned on.
2. Run the device self-test.

If the device self-test does not run correctly, the problem is in the device. Refer to the device service manual.

If the device self-test runs correctly, connect the USB parallel test cable (P/N 05K2580) on the USB connector

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and run the advanced diagnostic tests. If the test detects an error, replace the defective part.

How to Run the Diagnostics

This section describes how to run the diagnostics for both the computer and the SelectaDock Docking System.

The following table lists the special tools used for the diagnostics:

Tool Name	Part Number
PC test card	35G4703
Tri-connector wrap plug	72X8546
USB parallel test cable	05K2580

Diagnostics for the ThinkPad Computer

Use either the TrackPoint or the cursor-moving keys to interact with the tests. The **Enter** key works the same as selecting the **OK** icon to reply OK.

- ***For ThinkPad 770:***
  1. Press and hold **F1**; then power on the computer. Hold **F1** down until the Easy-Setup window appears.
  2. Click on **Test**. The basic diagnostic menu appears.
  3. Click on a device to run the test. The test progress window appears; then **OK** appears under the tested device icon if the test ends without any errors.
  4. Start the advanced diagnostic test by pressing **Ctrl**+**A** on the basic diagnostic menu. The ThinkPad FRU connections window appears.
  5. Click on **Exit** or press **Esc**. The keyboard test window appears.
  6. When you press a key, a mark appears or disappears on the corresponding key position on the screen. Repeat this step for any keys that need to be tested.
  7. To exit the test, click on **Exit** or press **Ctrl**+**Break**. The advanced diagnostics window appears.
  8. Do one of the following:
     - Click on a device to start the tests.
     - Click on **Test All** to test all devices.
     - Click on **Loop Test** to run the tests in a repeated loop. The loop option menu appears. Click on a device; a √ mark appears beside the selected device. Repeat this step to select multiple devices. Click on **OK** to start the diagnostic loop. If no device is selected, all devices tests are looped.

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To exit the loop, keep pressing **Ctrl**+**Pause** until the test exits. A beep sounds to notify that the exit interrupt is sensed by the test program. Press **Esc** to exit from the loop test.

9. Press **Esc** to exit from the test.

- ***For ThinkPad 76x series:***
  1. Press and hold **F1**; then power on the computer. Hold **F1** down until the Easy-Setup screen appears.
  2. Select **Test** and press **Enter**.
  3. Select a device and press **Enter** to run the test. The test progress window appears. **OK** appears when the test ends without any errors.
  4. Start the advanced diagnostic test by pressing **Ctrl**+**A** on the basic diagnostic menu.
  5. Do one of the following:
     - Select **Tool** for the test using tools. To select multiple devices, press the **Spacebar**. A √ mark appears beside the selected devices. Press **Enter** to start the test.
     - Select **Test All** and press **Enter** to test all devices.
     - Select **Loop Test** to run the tests in a repeated loop.

       The loop test window appears when you can select a device. Press the **Spacebar** to select a device. Repeat this step to select multiple devices. Press **Enter** to start the loop test. If no device is selected, all device tests are looped.

       To exit the loop, keep pressing **Ctrl**+**Pause** until the test exits. A beep sounds to notify that the exit interrupt is sensed by the test program.
  6. Press **Esc** to exit from the test.

Error Log: Diagnostic errors are printed on a printer that is attached to the parallel port when the error is detected. The error is also logged in the system memory.

Use the following procedure to display the errors:

1. Enter the advanced diagnostic test.
2. Press **Ctrl**+**E**.
3. The error log appears.
4. To exit the screen, click on **Exit** or press **Esc** key.

The error log is not saved when system power is turned off.

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PC Test Card LED: The green LED on the PC test card (P/N35G4703) lights when the PCMCIA test is running. If the LED does not go on, check that the card is installed correctly by reseating the card. If it still does not light after reseating, try using another slot for the test. If the LED still does not go on and the test fails, replace the FRU shown in the diagnostic error code.

Errors during the POST: If the POST detects an error, a 3-to-8-digit error code is displayed.

Memory Errors: If the POST detects a memory error in the first 640 KB of system memory, all the first bank memory is deallocated and the test continues with the second 640 KB of memory. If the total amount of error-free memory becomes less than 2 MB, a 2XX POST error occurs and the system stops. All the remaining memory is used as system memory. When the POST memory test completes, the usable memory size is compared with the configuration data. If a mismatch is detected, a 2XX error code occurs. The user can continue with system operation by pressing **Esc** and **F1** after restart and call for service at a later time.

The memory that is deallocated because of the POST process is kept by the hibernation or suspend functions. For this memory to be tested, it must be reconfigured as part of the original memory size. You configure by turning the power off and on.

Deallocation support is done only by the POST for memory errors. All irrecoverable memory errors that occur during normal operation cause an interrupt to the operating system.

Diagnostics for the SelectaDock Docking System

The SelectaDock Docking System Options Diskette helps you troubleshoot the expansion unit, SCSI adapter, and SCSI device problems through a series of menus.

Run the diagnostics after you have completed the installation of your SelectaDock Docking System and SCSI devices to verify that these devices work correctly. Do the following:

1. Turn off the computer on the SelectaDock Docking System and external SCSI devices.
2. Insert the Option Diskette (the diskette is shipped with the SelectaDock III) into drive A.
3. Turn on all attached external SCSI devices and the computer on the SelectaDock Docking System.
4. The **Logo Screen** appears.
5. After a few seconds the **Main Menu** appears.

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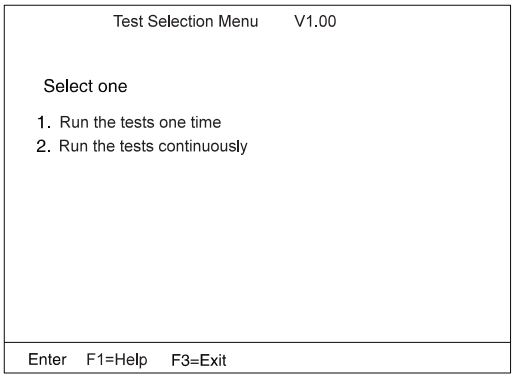
6. Select a device for testing and go to the respective section.

Testing the Expansion Unit

1. The **Test Selection Menu** appears when you select **Test Expansion Unit** on the **Main Menu**:



2. Select an item and follow the instructions that appear on the screen.

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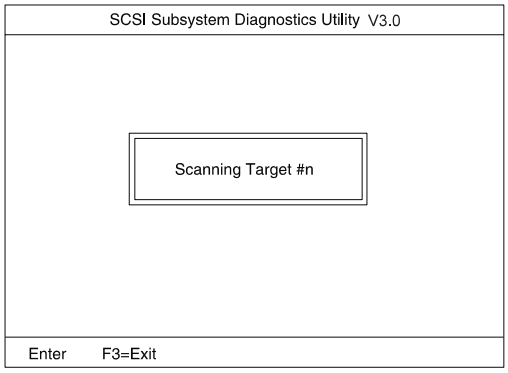
Testing the SCSI Subsystem

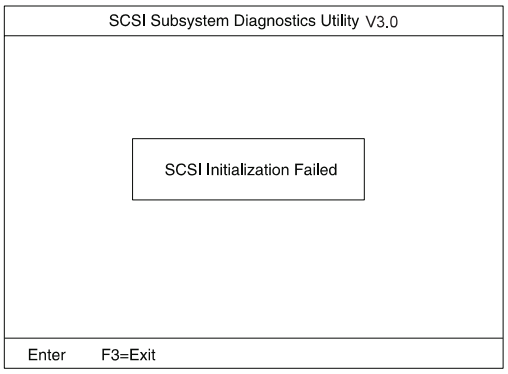
Note: If a SCSI adapter is installed in an PCI adapter card slot, remove it before running the SCSI diagnostic program.

1. If you select **Test SCSI Subsystem** on the **Main Menu**, the diagnostics program checks the system configuration for SCSI devices.

   If a SCSI controller is found, the computer goes on to initialize the SCSI devices. The following is displayed whether a SCSI controller is found or not:



2. If the initialization fails, the following appears:



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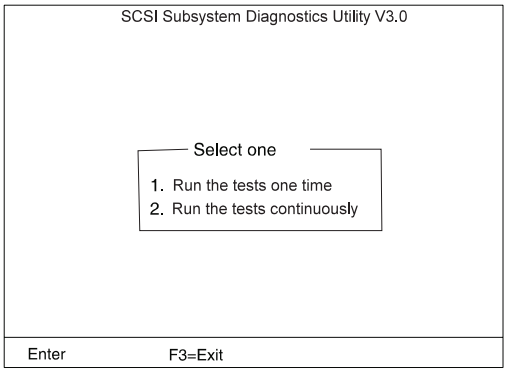
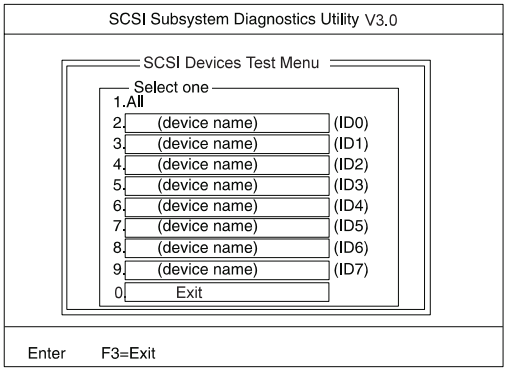
If the initialization ends successfully, the following appears. Select an item:



3. The **SCSI Devices Test Menu** appears. Select one of the devices:



The device name may be any of the following:

- SCSI hard disk.
- SCSI tape drive.
- SCSI CD-ROM.
- SCSI optical drive.
- No device.

The SCSI controller of the SelectaDock Docking System appears as ID7 on the screen.

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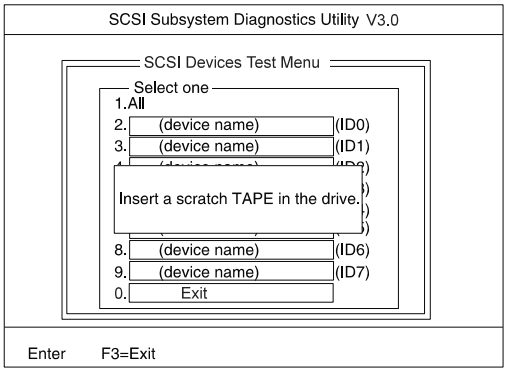
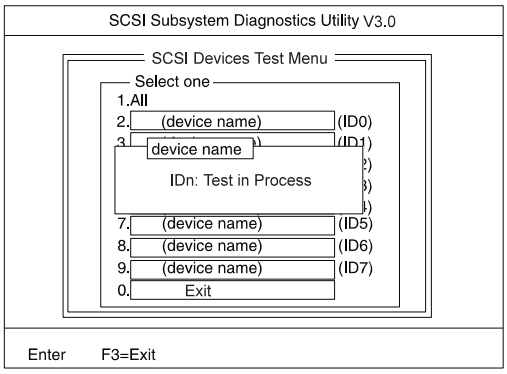
If a SCSI device exists and a test medium is required to test the SCSI device, the following pop-up appears (in this example, a SCSI tape drive):



4. Insert the requested medium and wait approximately 30 seconds until the medium is loaded.

   The test begins and the following pop-up appears:



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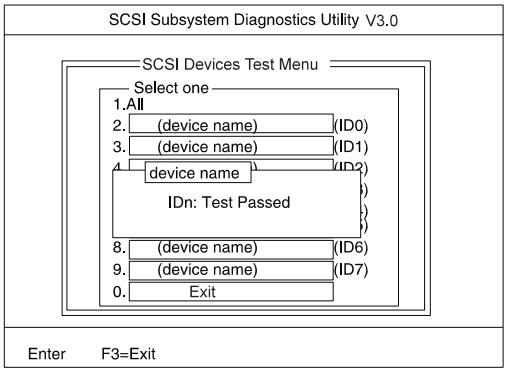
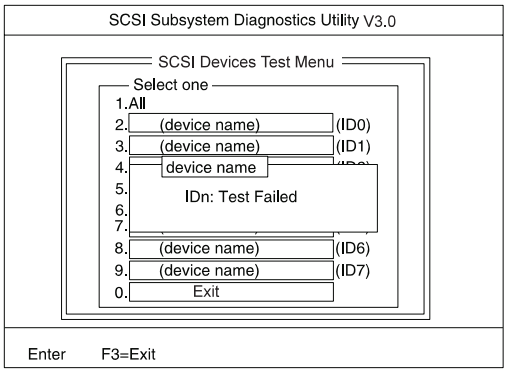
If the test is successful, the following appears:



If the test is unsuccessful, the following appears:



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Symptom-to-FRU Index

The Symptom-to-FRU Index lists error symptoms and possible causes. The most likely cause is listed first.

Note: Replace the FRUs one at a time in the sequence shown in the FRUs of the SelectaDock Sequence of Actions column. If a replaced part did not resolve the problem, put the original part back in the SelectaDock Docking System. Do not replace nondefective parts.

Always begin with "General Preparation" on page 624. This index also can be used to help you to decide which FRUs to be replaced when servicing the SelectaDock Docking System.

Numeric error codes show the errors detected in the POST or system operation. An **X** in the error code represents any number.

FRU codes are used for errors detected by diagnostic tests.

If no error codes are available, use narrative symptoms.

If the symptom is not listed or you cannot correct the problem using this index, go to "Undetermined Problems" on page 653.

IMPORTANT:

1. Before replacing any SCSI device, verify that there are no duplicate SCSI ID settings.
2. Make sure that there are no conflicts of hardware settings, such as interrupt level, memory address, DMA channel, and I/O address.
3. If you have both an error message and an incorrect audio response, diagnose the error message first.
4. If you cannot run the advanced diagnostic tests, but did receive a POST error message, diagnose the POST error message.
5. If you did not receive an error message, look for a description of your error symptoms in the first part of this index.
6. Check all power supply voltages before you replace the main card, riser card, and audio card of the SelectaDock Docking System. (See "Power Supply" on page 626.)

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Numeric Error Codes

Symptom or Error	FRUs of the SelectaDock Sequence of Actions
10X, 11X 101: Interrupt failure. 102: Timer failure. 103: Timer interrupt failure. 104: Protected mode failure. 105: Last 8042 command not accepted. 107: NMI test failure. 108: Timer bus test failure. 109: Low meg-chip select test.	1. **Adapter in slot (if used)**. 2. Riser card. 3. Main card.
195 (The computer was docked to the SelectaDock Docking System while in hibernation mode.)	1. **Do the following steps:** **a. Turn off and undock the system.** **b. Turn on and shut down the system.** **c. Turn off and dock the system.**
1XX	**See the hardware maintenance manual for the computer. If the problem persists, go to "Undetermined Problems" on page 653.**
2XX 201: Memory data error. 202: Memory line error 00–15. 203: Memory line error 16–23. 205: Memory test failure on on-board memory. 221: ROM to RAM remap error.	1. **See the hardware maintenance manual for the computer**. 2. Main card.
3XX	**See "External Keyboard" on page 629.**

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Symptom or Error	FRUs of the SelectaDock Sequence of Actions
6XX	1. **Before changing any devices, run the diagnostic test.** 2. FDD external attachment kit. 3. Diskette drive assembly. 4. Riser card.
11XX, 12XX	1. **Serial devices**. 2. Communication cable. 3. Riser card.
17XX	1. **Hard disk drive (2.5-inch ThinkPad hard disk drive)**. 2. Main card.
24XX	1. **Main card**. 2. Riser card.
860X	1. **Mouse**. 2. External keyboard. 3. Riser card.
I9990301, I9990302 I9990305	**See the hardware maintenance manual for the computer**.
Not shown above	1. **See the hardware maintenance manual for the computer.** 2. See “Undetermined Problems” on page 653.

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Diagnostic Error Codes

A detected error is shown as in the following example:

- A large **X** to the left of the device icon
- Device ID (three digit)
- Error code (two digit)
- FRU code (four digit)

The device ID and error code are used to indicate the detail portion of the FRU that caused the error. If replacing a FRU does not correct the problem, see the device ID or error code from the previous failure. If they have changed, the cause might be because the new FRU is defective or that the FRU was incorrectly installed.

Device ID: If an error is detected by the diagnostic tests, a three digits device ID is displayed. The device ID indicates the suspected device:

Icon	Device ID	Suspected Device
SystemBoard	001	System board
	003	Keyboard
	007	Math coprocessor
	086	Pointing device
Memory	002	Memory
Display	050	Display
	053	Enhanced video
	052	MPEG
1 HDD-1	017	Hard disk drive
2 HDD-2	151	Hard disk in UltraBay
3 HDD-3	067	External hard disk drive
4 HDD-4	152	Second external hard disk drive

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Icon	Device ID	Suspected Device
FDD-1	006	Diskette drive
FDD-2	066	External diskette drive
PCMCIA-1	080	PCMCIA
PCMCIA-2	088	External PCMCIA
Parallel	009	Parallel
Serial	011, 012	Serial
USB-1	154	Universal serial bus (USB port)
USB-2	155	USB port for the port replicator
USB-3	156	First external USB port
USB-4	157	Second external USB port
DSP	113	DSP
CDROM-1	215	CD-ROM
CDROM-2	216	External CD-ROM
DVD-1	217	DVD drive
DVD-2	218	External DVD drive

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Icon	Device ID	Suspected Device
Infrared	103	IR
Audio	150	Audio (ESS)
	153	Audio (Crystal)

FRU Codes: If an error is detected by the diagnostic tests, a four-digit FRU code is displayed. The FRU code indicates two suspected FRUs. Replace the FRU that is indicated by the ***two leftmost digits*** first; then replace the FRU that indicated ***two rightmost digits.*** No FRU is assigned to code 00. If only one FRU is suspected, the other FRU code is filled with zeros. See the reference page before replacing the FRU.

FRU Code	FRU
10	1. System board.
30	Reserved.
32	1. External keyboard. 2. Main card. 3. Riser card.
33	1. External mouse. 2. Main card. 3. Riser card.
45	External monitor.
51	1. Reseat the diskette drive (FDD-2). 2. Diskette drive (FDD-2). 3. Main card. 4. Riser card.
61	1. Reseat the hard disk drive in the SelectaDock Docking System (HDD-3). 2. Hard disk drive in the SelectaDock Docking System (HDD-3). 3. Main card.
63	1. Reseat the second hard disk drive in the SelectaDock Docking System (HDD-4) 2. Second hard disk drive in the SelectaDock Docking System (HDD-4). 3. Main Card.
70	PCMCIA-2 (port replicator).
73	Port replicator.
74	Main card.
75	USB card.
90	CD-ROM drive.
91	CD-ROM drive in the SelectaDock III.

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FRU Code	FRU
92	DVD drive.
93	DVD drive in the SelectaDock III.

If the problem persists after replacement of the FRUs, go to “Undetermined Problems” on page 653.

Adapter-Related Symptoms

Symptom or Error	FRUs of the SelectaDock Sequence of Actions
An adapter card does not work.	Check that: 1. The adapter card is designed for the docking station adapter slot. 2. The system resources are assigned correctly by its utility program, if the adapter card is a non-PnP ISA adapter bus type. 3. The driver diskette is up to date. Contact the driver manufacturer. The accompanying diskette may support only older desktop computers. See the adapter card documentation that came with the option to diagnose problems.

Audio-Related Symptoms

Symptom or Error	FRUs of the SelectaDock Sequence of Actions
The audio equipment does not work.	Check that: 1. The audio equipment works when connected directly to the computer. 2. The audio equipment is designed to be supported by this product.

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Beep Symptoms

Symptom or Error	FRUs of the SelectaDock Sequence of Actions
Beep sounds continuously.	1. Check that the ThinkPad model is correct. (See “General Preparation” on page 624.) 2. Security feature group. 3. Main card. 4. Audio card.

Indicator-Related Symptoms

Symptom or Error	FRUs of the SelectaDock Sequence of Actions
The power-on indicator does not turn on, the fan does not run, and the computer is not functional.	See “Undetermined Problems” on page 653.
The computer is functional and the fan runs, but the power-on indicator does not turn on.	1. Check the connector for the LCD indicator. 2. Main card. 3. Go to “Power Supply” on page 626.
The LCD indicator (SelectaDock) for the hard disk drive stays on.	1. 2.5-inch hard disk drive on the UltraBay II tray or IDE drive in the device space bay of the SelectaDock III.
The LCD indicator (SelectaDock) for the hard disk drive is not working, but the SelectaDock is functional.	1. Check the connector for LCD indicator. 2. Upper cover group. 3. Main card.

Keyboard-Related Symptoms

Symptom or Error	FRUs of the SelectaDock Sequence of Actions
One or more keys do not work on the external keyboard, but the SelectaDock is otherwise functional.	Go to “External Keyboard” on page 629.

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MIDI/Joystick-Port-Related Symptoms

Symptom or Error	FRUs of the SelectaDock Sequence of Actions
The MIDI/joystick does not work.	Check if the computer supports the MIDI device, when the problem occurs only during MIDI operation.

PC Card-Related Symptoms

Symptom or Error	FRUs of the SelectaDock Sequence of Actions
A PC Card does not work.	1. Reseat the PC card. 2. Check that: a. The PC card can be used without any problem when installed in the computer or another SelectaDock that has no problem. b. The PC card is correctly set up, including the computer resource assignments and device driver installation. 3. Run the diagnostic test for the PC Card. 4. Main card.

Peripheral-Device-Related Symptoms

Symptom or Error	FRUs of the SelectaDock Sequence of Actions
The external monitor screen changes colors.	Go to “External Monitor” on page 630.

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Power-Related Symptoms

Symptom or Error	FRUs of the SelectaDock Sequence of Actions
Although the computer is turned off, the fan of the SelectaDock III power supply is running.	1. Power supply unit.
The power of SelectaDock III cannot be turned off.	1. Reseat the port replicator and the computer. 2. Power supply unit.

SCSI Device-Related Symptoms

Symptom or Error	FRUs of the SelectaDock Sequence of Actions
The external SCSI device does not work.	1. Check that the SCSI device is powered on. 2. Check that the SCSI device is terminated at the last device. 3. Reseat the drive. 4. Run the drive test. 5. Main card.
The internal SCSI device does not work.	1. Reseat the drive. 2. Check that the SCSI cables are connected correctly. 3. Check that the terminator on the SCSI drive in the SelectaDock is removed. 4. Run the drive test. 5. Main card.

Sound Blaster-Related Symptoms

Symptom or Error	FRUs of the SelectaDock Sequence of Actions
The Sound Blaster or compatible adapter card does not work.	Check if the MIDI/joystick of the computer has also been disabled. See the user's guide for the computer.

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UltraBay II Tray-Related Symptoms

Symptom or Error	FRUs of the SelectaDock Sequence of Actions
The HDD or FDD on the UltraBay II tray does not work correctly.	1. Reseat the drive. 2. Reseat the power cable and SCSI cable of the of the UltraBay II tray. (See “UltraBay II Tray” on page 660.) 3. Check that: a. The drive works correctly if it is installed in the UltraBay or UltraBay II of the computer. b. The IDE connector of the UltraBay II tray is connected correctly. c. No more than two IDE devices are installed including a device in the device space bay. 4. Run the drive test. 5. Main card.

USB Related Symptoms

Symptom or Error	FRUs of the SelectaDock Sequence of Actions
USB device does not work.	Verify that: The device self-test runs correctly. Check that: 1. Connect the device to the computer and works. 2. Make sure that the device is set correctly. 3. Run the advanced diagnostic test for the USB. 4. Main card. 5. USB card. 6. USB cable.

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Wake Up on LAN-Related Symptoms

Symptom or Error	FRUs of the SelectaDock Sequence of Actions
The SelectaDock Docking System does not wake up.	1. Check the connection of the wake up on LAN signal cable. 2. Make sure the network setting is correct. 3. Make sure that the computer model is 770 and that the wake up on LAN is enabled. 4. Main card. 5. Wake up on LAN signal cable.

Intermittent Symptoms

Symptom or Error	FRUs of the SelectaDock Sequence of Actions
An intermittent problem occurs.	The problem can be difficult to analyze, because it occurs just once in a while. If your docking station has such a problem: 1. Check that the computer is firmly attached to the docking station. 2. Check that all cables and power cords are securely connected to the SelectaDock system and to the attached options. 3. Check that the SCSI device is correctly terminated. 4. Do the loop test. Refer to the diagnostics section of computer model you are servicing. If the problem persists, write down what the problem is and what the system was doing when the problem occurred.

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Other Symptoms

Symptom or Error	FRUs of the SelectaDock Sequence of Actions
The computer does not work and the power-on indicator does not turn on, but the fan runs.	See "Undetermined Problems" on page 653.
There is a program-load error during remote IPL from the file servicer.	Network adapter card.
The HDD-3 or HDD-4 is not recognized and no error codes appear on the screen. (The password of the HDD-3 or HDD-4 is still set.) **Note:** The HDD-3 or HDD-4 icon indicates the 2.5-inch ThinkPad hard disk drive installed in the SelectaDock III.	1. Remove the hard disk password for the ThinkPad hard disk as follows: a. Remove the hard disk drive from the SelectaDock Docking System and install it to the computer. b. Remove the hard disk password.

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Undetermined Problems

Use the following procedure when the diagnostic tests do not identify the failing adapter or device.

Check that all cables, wires, and connectors are connected so that they do not cause a short circuit. If any problems are found, reconnect or replace them.

Check the power supply for correct operation (see “Power Supply” on page 626). If the power supply is operating correctly, return here and continue with the following procedure:

1. Turn off the computer.
2. Remove or disconnect the following adapters or devices one at a time from the SelectaDock Docking System. (Do not isolate adapters or devices that are known to be good.)
   a. Non-IBM devices.
   b. A modem, printer, mouse, external keyboard, external monitor, external diskette drive, numeric keypad, USB device, or other external devices.
   c. Any adapter.
   d. SCSI device.
   e. Hard disk drive.
3. Turn on the system and check if the problem has changed.
4. If the symptom remains, repeat steps 1 through 3 until you find the failing adapter card or device, or until all adapter cards or devices have been removed.
5. If all adapters or devices have been removed and the problem remains, replace the following the SelectaDock III FRUs one at a time.

   Note: If a replaced part did not resolve the problem, put the original part back in the SelectaDock III. Do not replace nondefective parts.

   a. Riser card.
   b. Main card.
   c. Audio card.
   d. USB card.

If the problem goes away when you remove an adapter card, but replacing the adapter card does not correct the problem, replace the main card.

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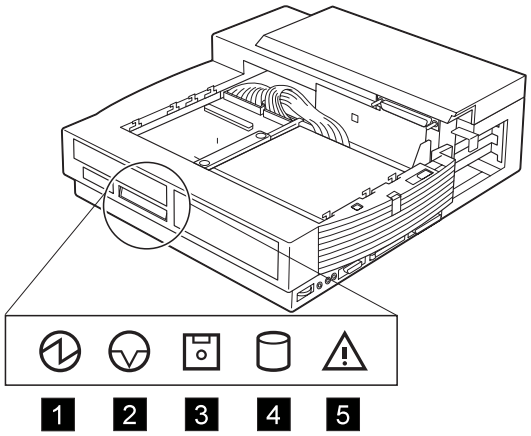
Product Overview (3547-003)

Status Indicator

Check the SelectaDock Docking System status using the following icons:



Icon	Meaning
1	Power on
2	Suspend mode
3	Diskette drive in use
4	Hard disk in use
5	Attention

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Product Overview: The following provides an overview of the system features:

Feature	Description
PCI or ISA slot	• 2 shared full-size PCI/ISA slots and 1 half-size PCI slot. The maximum number of supported adapter cards is 3.
Bays	• UltraBay II. – ThinkPad option using the UltraBay II tray. – CD-ROM, FDD, HDD, and DVD drive. • Device space bay. – All available storage SCSI/IDE devices.
Audio subsystem	• Speaker. • Audio line-out. • Stereo speaker. • Stereo audio amplifier. • Headphone. • Manual volume control.
Ports	• MIDI/joystick port. • SCSI2. • Docking connector. • USB ports.
Wake up on LAN	• Capability of supporting the wake up on LAN adapter.
PC Card	• 2 Type-I or Type-II, or 1 Type-III PC Card.
Security	• PCI or ISA card protection. • PC Card lock. • Compulock lock hole.

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FRU Removals and Replacements

This section contains information on removals and replacements, as well as locations.

- The arrows in the removals and replacements show the direction of movement to remove a field replaceable unit (FRU), or to turn a screw to release the FRU. The arrows are marked in numeric order to show the correct sequence of removal.
- When other FRUs must be removed before the failing FRU is removed, they are listed at the top of the page. Go to the removal procedure for each FRU listed, remove the FRU, and then continue with the removal of the failing FRU.
- To replace a FRU, reverse the removal procedure and follow any notes that pertain to replacement. See “Locations” on page 673 for internal cable connections and arrangement information.

Safety Notice 8: Translation on page 14

Before removing any FRU, power-off the computer, unplug all power cords from electrical outlets, remove the battery pack, and then disconnect any interconnecting cables.

Note: You must use an electrostatic discharge (ESD) strap to establish personal grounding.

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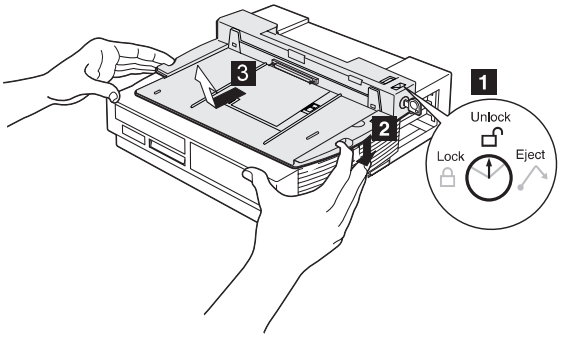
1010 Port Replicator

Make sure that the security key is set to the Unlock position 1 and release the latch 2 ; then undock the port replicator 3 .



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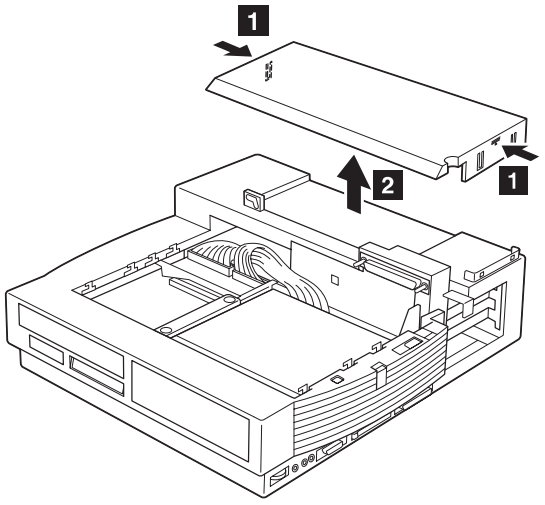
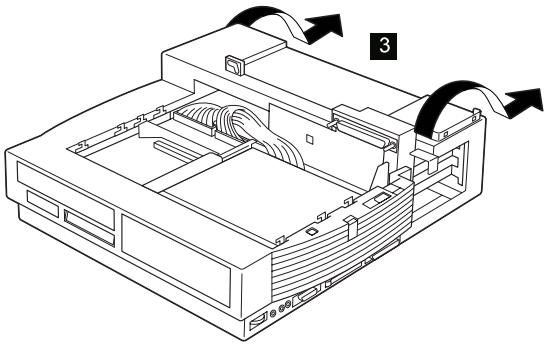
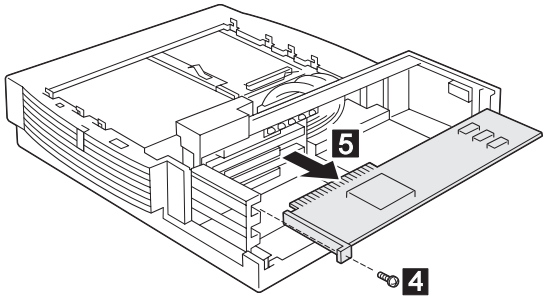
1020 Option Card Cover and Option Card





If an option card is installed, remove it.



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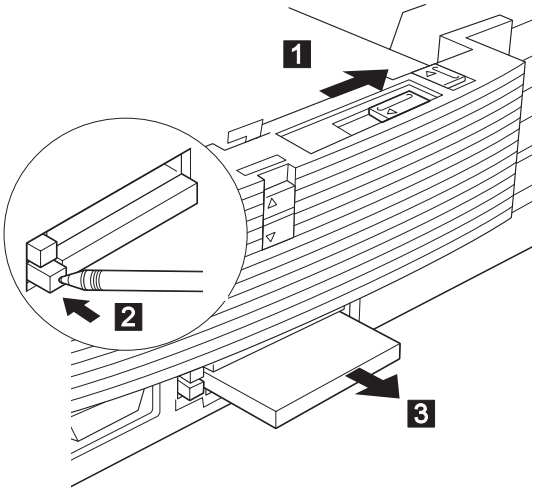
1030 PC Card



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1040 UltraBay II

- Port Replicator **(1010)**

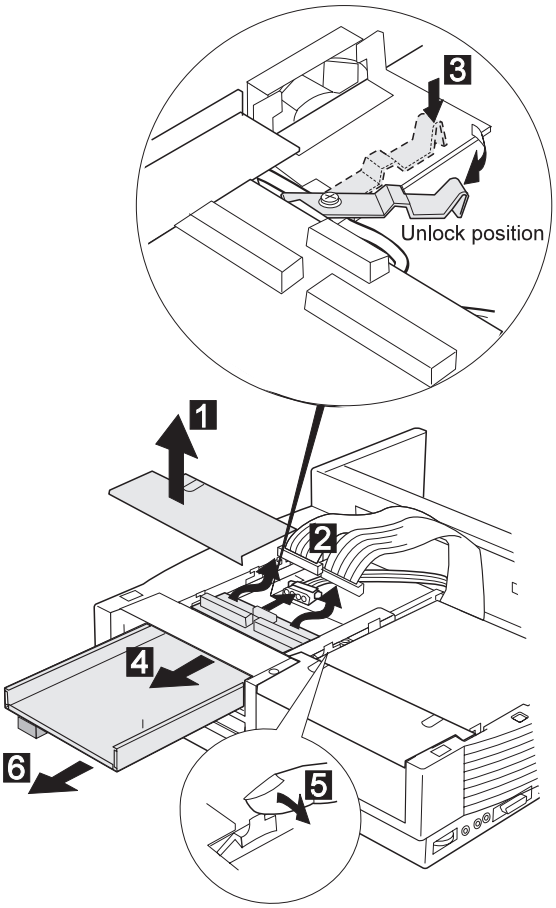
The customer can install a ThinkPad option (such as an HDD, an FDD, or a CD-ROM drive) in the UltraBay II tray.

Remove the device that is installed in the UltraBay II; then remove the UltraBay II tray or device tray as follows:

Attention

A hard disk or a diskette drive is sensitive to physical shock. Be careful not to drop or apply any shock to these devices.

UltraBay II Tray



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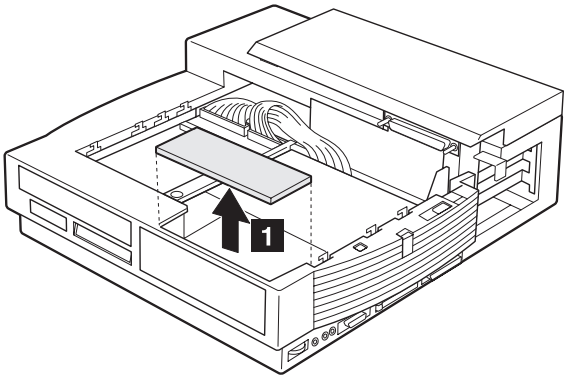
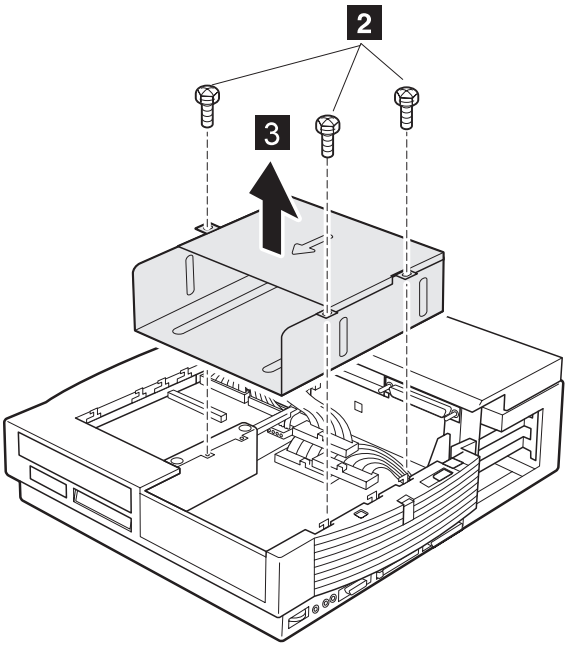
1050 Device Space Bay Frame

- Port Replicator **(1010)**





Step	Length (Quantity)	Memo
2	M 3 x 6 mm (3)	Hex stud screw

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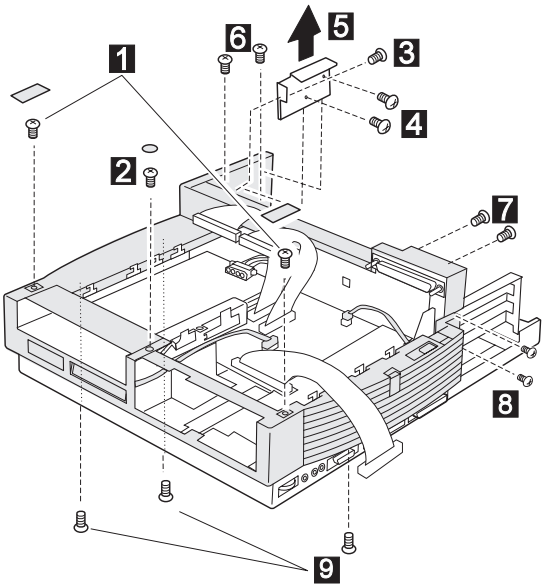
1060 Upper Cover

- Port Replicator **(1010)**
- Option Card Cover and Option Card **(1020)**
- UltraBay II **(1040)**
- Device Space Bay Frame **(1050)**

Important

Make sure all power cords are unplugged before removing covers.



Step	Length (Quantity)	Memo
1	M 3 x 6 mm (2)	
2	M 3 x 8 mm (1)	Flat head (black)
3	M 3 x 4 mm (1)	
4	M 3 x 6 mm (2)	
6	M 3 x 8 mm (2)	Self-tapping screw
7	M 3 x 8 mm (2)	Black
8	M 3 x 8 mm (2)	Black
9	M 3 x 8 mm (3)	Self-tapping screw

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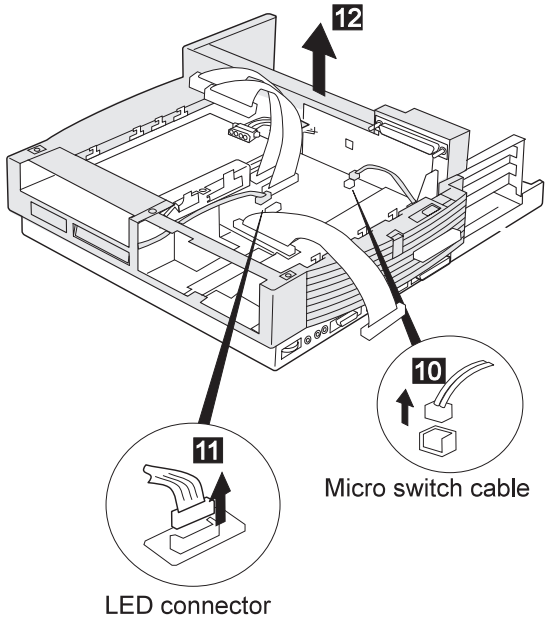
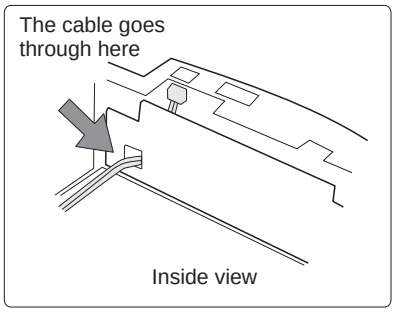


When replacing:

The following figure shows the route of the micro switch cable:



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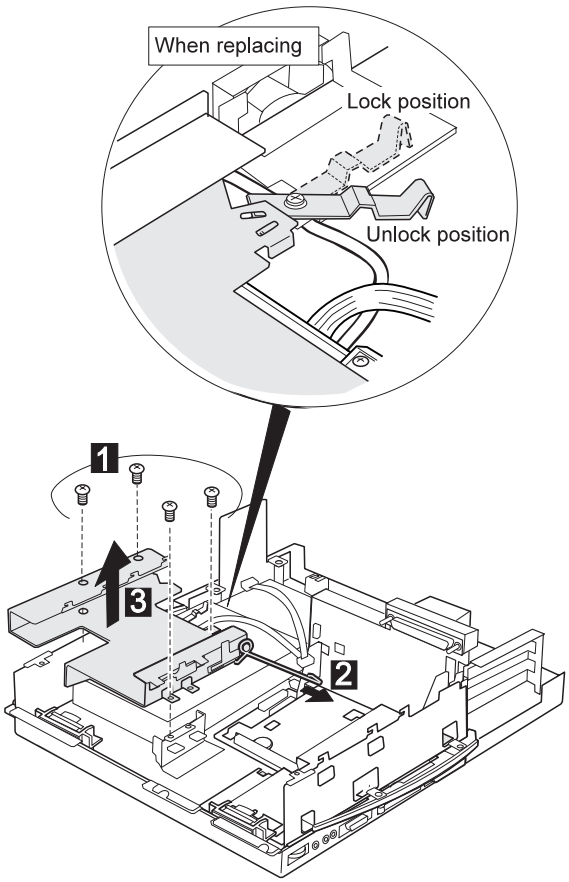
1070 Bracket

- Port Replicator **(1010)**
- Option Card Cover and Option Card **(1020)**
- UltraBay II **(1040)**
- Device Space Bay Frame **(1050)**
- Upper Cover **(1060)**



Step	Length (Quantity)	Memo
1	M 3 x 6 mm (4)	

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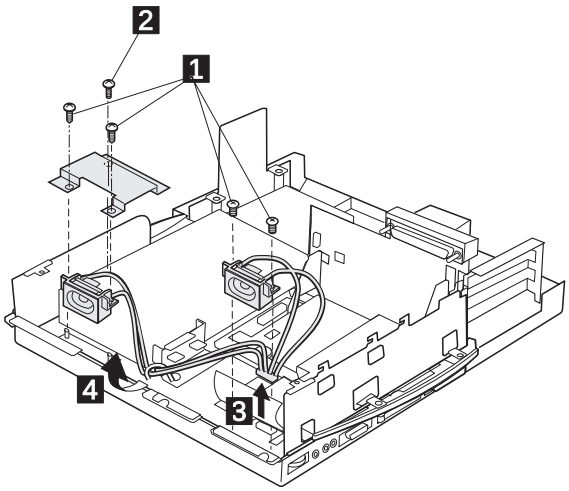
1080 Speaker Assembly

- Port Replicator **(1010)**
- Option Card Cover and Option Card **(1020)**
- UltraBay II **(1040)**
- Device Space Bay Frame **(1050)**
- Upper Cover **(1060)**
- Bracket **(1070)**



Step	Length (Quantity)	Memo
1	M 3 x 8 mm (4)	Self-tapping screw
2	M 3 x 6 mm (1)	

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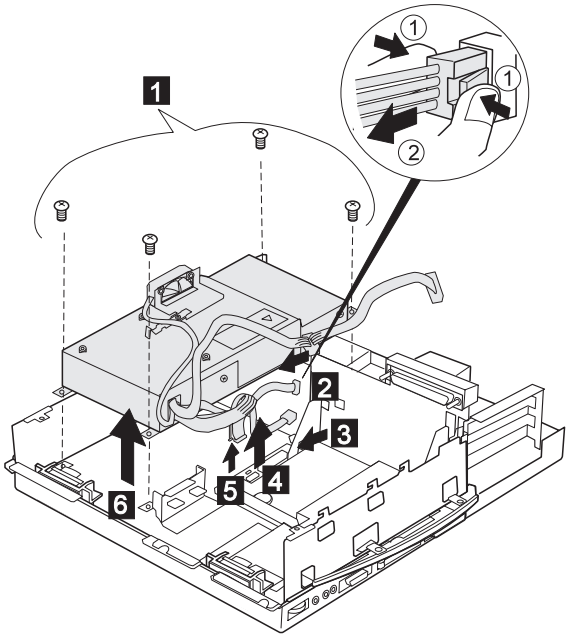
1090 Power Supply

- Port Replicator **(1010)**
- Option Card Cover and Option Card **(1020)**
- UltraBay II **(1040)**
- Device Space Bay Frame **(1050)**
- Upper Cover **(1060)**
- Bracket **(1070)**



Step	Length (Quantity)	Memo
1	M 3 x 6 mm (4)	

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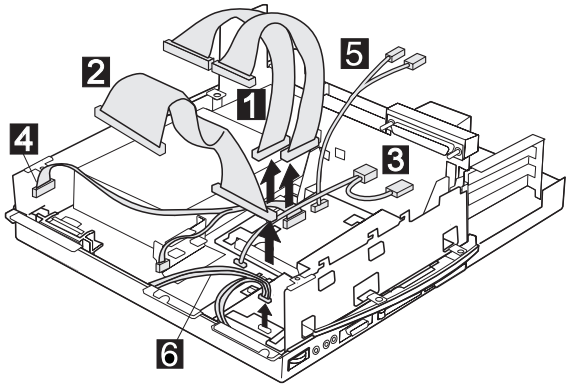
1100 Cables

- Port Replicator **(1010)**
- Option Card Cover and Option Card **(1020)**
- UltraBay II **(1040)**
- Device Space Bay Frame **(1050)**
- Upper Cover **(1060)**

This step is a preparation for removing the main card assembly. Remove the IDE cables 1, the SCSI cable 2, the audio cable 3, the USB cable 4, the wake-on signal cable 5, and the speaker cable 6.



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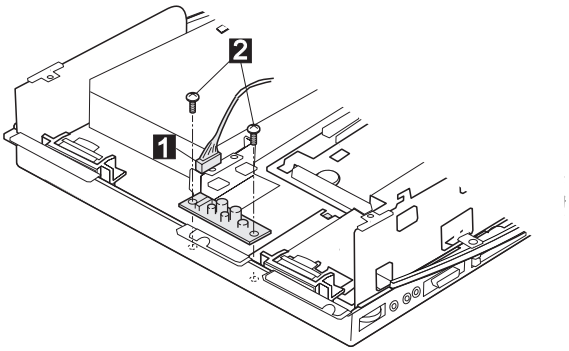
1110 DC-DC Card

- Port Replicator **(1010)**
- Option Card Cover and Option Card **(1020)**
- UltraBay II **(1040)**
- Device Space Bay Frame **(1050)**
- Upper Cover **(1060)**



Step	Length (Quantity)	Memo
2	M 3 x 6 mm (2)	

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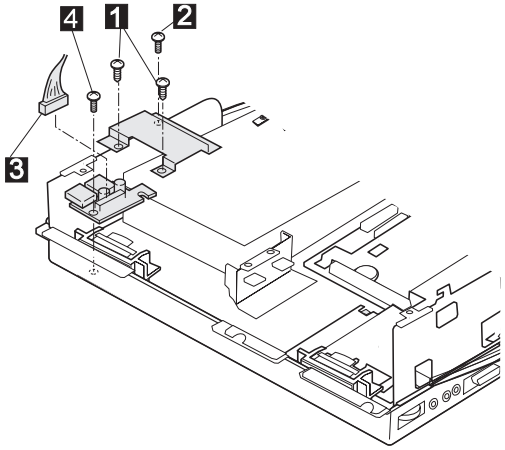
1120 USB Card

- Port Replicator **(1010)**
- Option Card Cover and Option Card **(1020)**
- UltraBay II **(1040)**
- Device Space Bay Frame **(1050)**
- Upper Cover **(1060)**



Step	Length (Quantity)	Memo
1	M 3 x 8 mm (2)	Self-tapping screw
2	M 3 x 6 mm (1)	
4	M 3 x 6 mm (1)	

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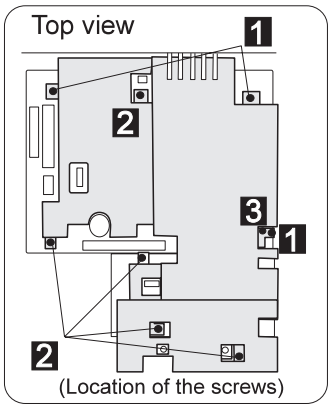
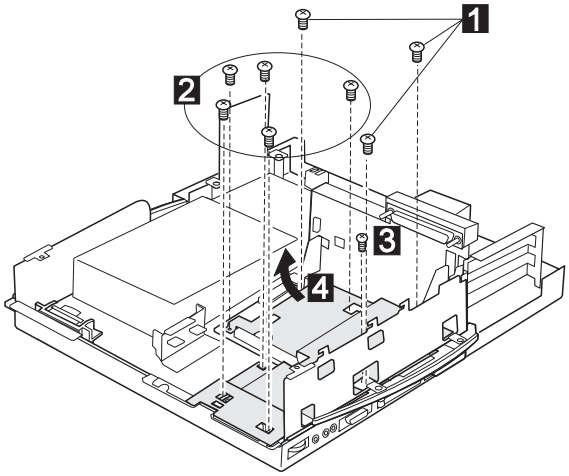
1130 Shield Cover

- Port Replicator **(1010)**
- Option Card Cover and Option Card **(1020)**
- UltraBay II **(1040)**
- Device Space Bay Frame **(1050)**
- Upper Cover **(1060)**
- Bracket **(1070)**





Step	Length (Quantity)	Memo
1	M 3 x 8 mm (3)	
2	M 3 x 6 mm (5)	
3	M 2 x 6 mm (1)	

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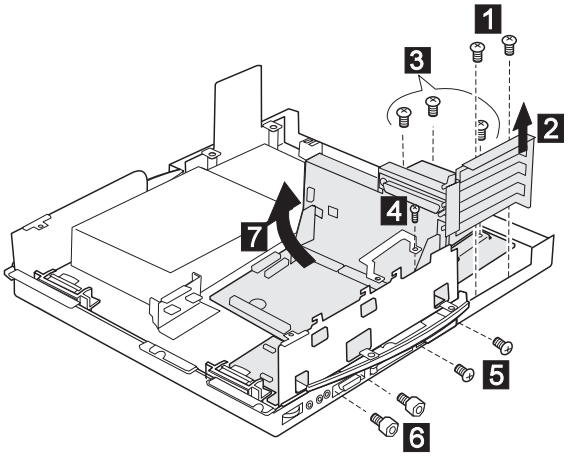
1140 Main Card Assembly

- Port Replicator **(1010)**
- Option Card Cover and Option Card **(1020)**
- UltraBay II **(1040)**
- Device Space Bay Frame **(1050)**
- Upper Cover **(1060)**
- Bracket **(1070)**
- Cables **(1100)**
- Shield Cover **(1130)**



Step	Length (Quantity)	Memo
1	M 3 x 6 mm (2)	
3	M 3 x 8 mm (3)	Self-tapping screw
4	M 2 x 6 mm (1)	
5	M 2.6 x 8 mm (2)	
6	M 3 x 8 mm (2)	Hex head (5 mm)

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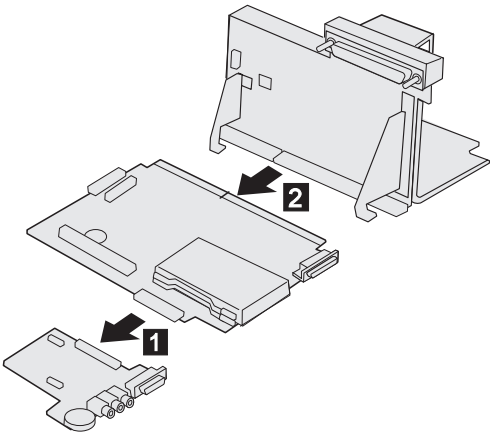
1150 Audio Card, Main Card, and Riser Card

- Port Replicator **(1010)**
- Option Card Cover and Option Card **(1020)**
- UltraBay II **(1040)**
- Device Space Bay Frame **(1050)**
- Upper Cover **(1060)**
- Bracket **(1070)**
- Cables **(1100)**
- Shield Cover **(1130)**
- Main Card Assembly **(1140)**

1 : For removing the audio card

2 : For removing the riser card

1 , **2** : For removing the main board



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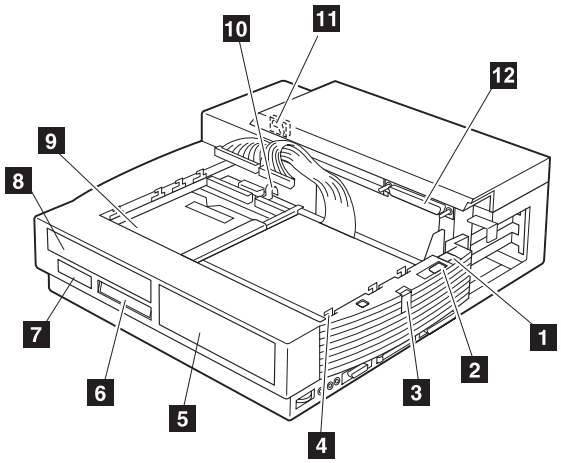
Locations

Front View

1 Multiuser lock
2 PC Card lock
3 Port replicator lock
4 Docking guide
5 Device space
6 Status indicators
7 Device eject button
8 UltraBay II
9 UltraBay II tray
10 UltraBay II latch
11 Compulock lock hole
12 Expansion connector



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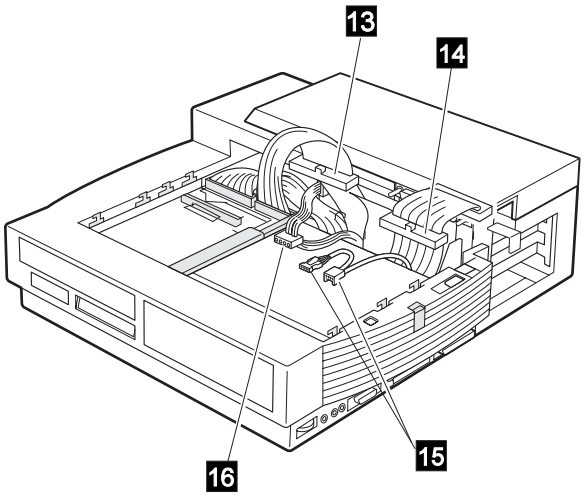
Front View (continued)

13 IDE connector
14 Internal SCSI connector
15 Audio device connector
16 Power supply connector



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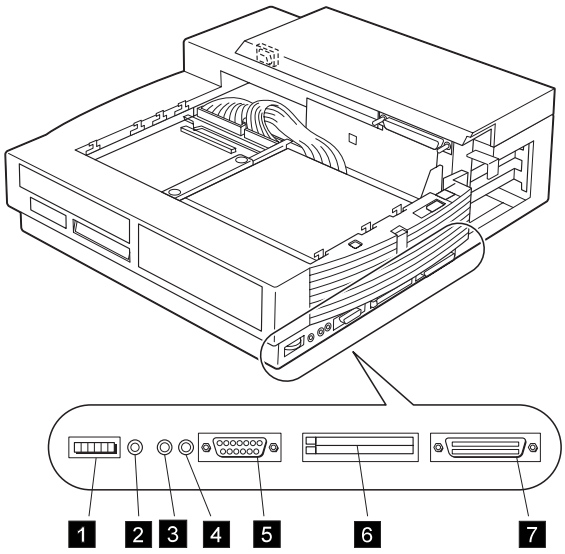
Side View

1. Volume knob
2. Headphone jack
3. Line-out jack
4. Speaker-in jack
5. MIDI/joystick port
6. PC Card (PCMCIA) slots
7. SCSI connector



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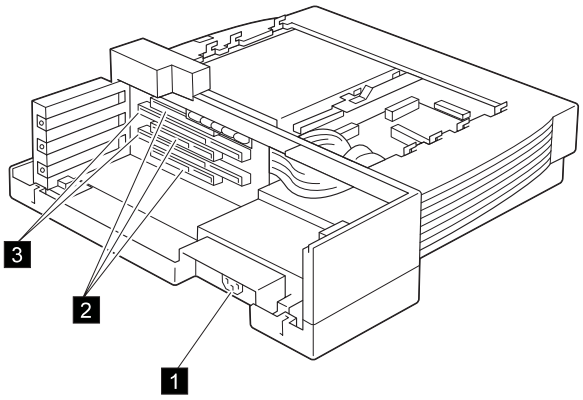
Rear View

1. Power jack
2. PCI connectors
3. ISA connectors



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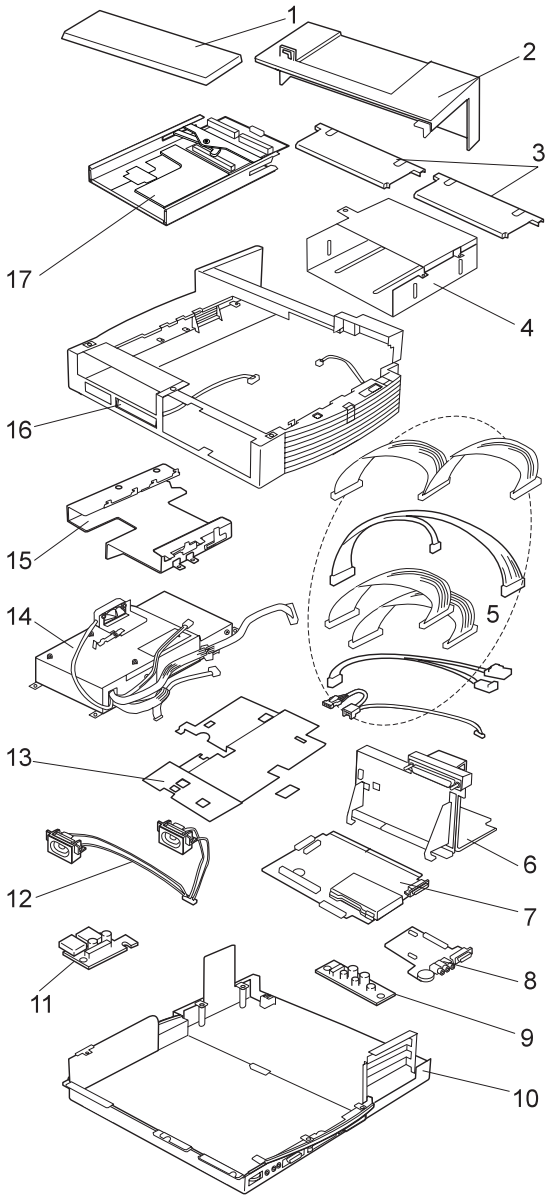
Parts Listing SelectaDock III (3547-003)



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1	Connector cover	73H7450
2	Rear cover	12J2493
3	Bezel	(Upper cover group)
4	Device space bay frame	82H6729
5	Cables	(Cable group)
6	Riser card	11J8831
7	Main card	(Main card assembly)
8	Audio card	12J2494
9	DC-DC card	12J2495
10	Base cover	11J8828
11	USB card	12J2496
12	Speaker assembly	39H7446
13	Shield cover	(Main card assembly)
14	Power supply	(Power supply group)
15	Bracket	(Power supply group)
16	Upper cover	(Upper cover group)
17	UltraBay II tray	11J8834

Cable group (Includes the following:) SCSI cable IDE cables Audio cable USB cable Wake-on signal cable	11J8833
Upper cover group (Includes the following:) Bezel Upper cover LCD indicator	11J8829
Power supply group (Includes the following:) Power supply Bracket	11J8827
Main card assembly (Includes the following:) Main card Shield cover	11J8832
Miscellaneous kit	39H7447

Options

SelectaDock Base Model I	39H7416
SelectaBase 770	11J8822
SelectaBase PC Card Enabler	11J8823

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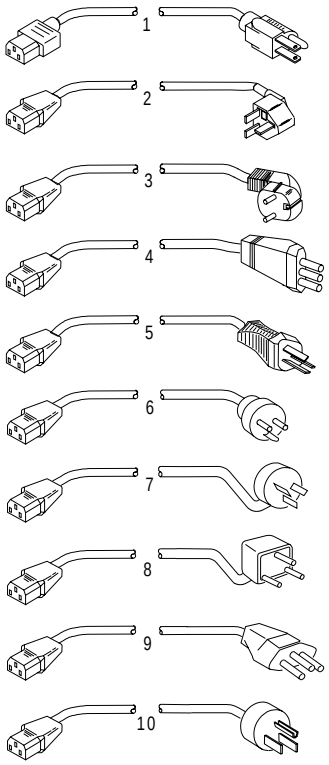
Power Cords



Warning:
Use the power cord certified for your country.

1	Colombia, U.S., Venezuela	13F9959
	Japan, 2-pin	6454377
	Japan, 3-pin	65F0031
2	Hong Kong, Singapore, U.K.	14F0033
3	France, Germany, Spain	13F9979
4	Italy	14F0069
5	Australia, New Zealand	13F9940
6	Denmark	13F9997
7	Israel	14F0087
8	Bangladesh, Pakistan, Sri Lanka, South Africa	14F0015
9	Switzerland	14F0051
10	Thailand	1838574

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Common Devices Checkout

External Diskette Drive Test 682
External Display Self-Test 682
External Keyboard/Auxiliary Input Device Checkout 683
Fax/Modem Checkout 684
Printer Checkout 686
Port Replicator Checkout 687
TrackPoint Checkout 688
TV Tuner 689
- Identifying Names and Functions 689
- Using the Front Panel 690
- Troubleshooting 693

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External Diskette Drive Test

Use the following procedure to isolate the diskette problem to a controller, drive or diskette. A scratch, write-enabled 2HD diskette is required.

1. Select the icon **FDD** on the **TEST MENU**. By doing this, the controller test and the drive read/write test run. If the controller test detects an error, FRU code 10 appears. In this case, replace the system board.
2. If the controller test run without errors, follow the instructions on the screen and insert a scratch diskette.
3. If the drive test detects an error, FRU code 50 appears. If the diskette media are known to be good, replace the drive or the drive cable.

External Display Self-Test

If the display problem occurs only when using an external display, use the following instructions to correct the problem.

Note

Before you replace a display, check the following list to see if it is connected correctly.

- 8506 and 8508 displays must be connected to an Image Adapter/A or an Image-I Adapter/A.
- 63XX and 85XX systems support either 63XX or 85XX displays.
- 85XX systems with an XGA-2 adapter support 95XX displays.
- 95XX systems support either 63XX, 85XX, or 95XX displays.
- ThinkPad models support either 85XX or 95XX displays.

If the screen is rolling, replace the display assembly. If that does not correct the problem, replace FRUs in the following order until the problem goes away:

1. Video card
2. Display adapter (any type)
3. System board
4. Bus adapter (if used)

If the screen is not rolling, run the display self-test as follows:

1. Power-off the computer and display.
2. Disconnect the display signal cable.
3. Power-on the display.
4. Set the contrast to its maximum position.
5. Set the brightness control to the center detent position.

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Check for the following conditions:

- You should be able to vary the screen intensity by adjusting the contrast and brightness controls.
- The screen should be white or light gray, with a black margin (test margin) on the screen.

  Note: The location of the test margin varies with the type of display. The test margin might be on the top, bottom, or one or both sides.

If you do not see a test margin on the screen, replace the display. If there is a test margin on the screen, replace the system board.

Note: On ThinkPad Models 700, 700C, 720C, 720C, do the following:

1. Video card
2. System board

External Keyboard/Auxiliary Input Device Checkout

The following auxiliary input devices may be available for IBM ThinkPad models.

- Numeric keypad
- Mouse (PS/2 compatible)
- External keyboard (with Keyboard/Miniature Mouse cable)

- If you suspect a problem with any of the auxiliary input devices (listed above), replace the device. If the problem is not corrected, replace the following FRUs one at a time to correct the problem.
  - Keyboard control card
  - System board
- If the computer receives an incorrect keyboard response, remove other external devices, check the keyboard connections, and recheck the keyboard responses. If the problem remains, replace the following FRUs one at a time to correct the problem.
  - Keyboard
  - Keyboard control card
  - System board
- If a 000**30100** error message appears, power-off the computer and the external devices. Then power-on the computer before you power-on the external devices.

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Fax/Modem Checkout

001

– Power-off the computer.
– Ensure that the modem is installed correctly.
– If the modem never worked in customer mode, ensure that all drivers are loaded correctly onto the computer.
– Ensure that the communication program is supported on the computer.
– Ensure that the public switch telephone network (PSTN) cable and the data access arrangement (DAA) cable, if installed, are connected correctly.

If you need to correct one of the above conditions, do so now; then continue.

Note: PCMCIA cards can be inserted and removed while the system is powered on.

– Power-on the system.
– Insert the IBM Data/FAX Modem diskette into the default diskette drive.
– If you are servicing a High Speed Internal Data/Fax Modem (Models FC3632 and FC3650), at the DOS prompt (for example, A:\), type **IBMDIAG**; then press **Enter**.
– If you are servicing a PCMCIA Data/FAX Modem (Models FC3634 and FC3635), at the DOS prompt (for example, A:\), type **ESTDIAG**; then press **Enter**.
– Follow the instructions on the screen. (If you need help, press **F1**.)

DID THE DIAGNOSTIC TESTS DETECT AN ERROR?

Yes **No**

002

The diagnostic tests have completed successfully. If you suspect a problem, go to Step 004.

003

Go to the Symptom-to-FRU Index for the computer you are servicing.

004

– Check the PSTN cable and the DAA cable, if installed, for continuity.

IS THE CABLE(S) GOOD?

Yes **No**

005

Replace the defective cable(s).

006

(Step **006** continues)

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006 (continued)
– Have the customer transmit a call.
WAS THE CALL TRANSMITTED SUCCESSFULLY?
Yes **No**

007

Go to Step 011.

008

– Have the customer receive an incoming call on the modem.
WAS THE INCOMING CALL RECEIVED?
Yes **No**

009

Go to Step 014.

010

The diagnostic tests have completed successfully. If you still suspect a problem that is not software related, replace the External DAA; then replace the modem.

011

– Have the customer transmit a call at a lower speed.
WAS THE CALL TRANSMITTED SUCCESSFULLY?
Yes **No**

012

If installed, replace the external DAA. If you do not have an external DAA installed, or replacing the external DAA does not correct the problem, replace the modem.

013

Have the telephone line checked.

014

– Have the customer receive an incoming call on the modem at a lower speed.
WAS THE INCOMING CALL RECEIVED?
Yes **No**

015

If installed, replace the external DAA. If you do not have an external DAA installed, or replacing the external DAA does not correct the problem, replace the modem.

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(CONTINUED)

016

Have the telephone line checked.

Printer Checkout

1. Make sure the printer is correctly connected and is powered-on.
2. Run the printer self-test.

If the printer self-test does not run correctly, the problem is in the printer. Refer to the printer service manual.

If the printer self-test runs correctly, do the following.

1. Verify the port settings in configuration.
2. Install a wrap plug on the port (indicated in configuration) and run the advanced diagnostic tests.
3. If the advanced diagnostic tests (with the wrap plug installed) do not detect a failure, replace the printer cable.
   If the problem is not corrected, replace the system board.

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Port Replicator Checkout

Use the following procedure to isolate a port replicator problem. A port replicator attaches to the system expansion connector at the rear of the computer.

1. Power-off the computer.
2. Remove the failing devices from the replicator.
3. Unplug the AC adapter from the replicator, if attached.
4. Remove the port replicator from the computer.
5. Reconnect the failing device directly to the computer. (If another device occupies the connector, remove it first.)
6. Go to General Checkout and follow that procedure.
7. If the advanced diagnostic device test does not find an error, suspect a problem with the port replicator or the system expansion bus.
8. Power-off the computer and reconnect the port replicator.
9. Power-on the computer and run the following advanced diagnostic tests:
   - Serial port test with the wrap plug installed on the replicator.
   - Parallel port test with the wrap plug installed on the replicator.
   - PCMCIA-2 test with the PC test card installed.
   - FDD-2 (FDD-1 if no drive is installed in the computer) drive test on the failing device.
10. If diagnostic errors appear, replace the replicator or diskette drive attachment unit.

    If the problem remains after the replacement, replace the system board.
11. If power problems appear only when using the replicator, replace the replicator.

If power shut downs occur intermittently when using PCMCIA-2 devices via a port replicator, suspect an over-current problem. Some PCMCIA devices use more power; if the maximum usage of each device occurs simultaneously, the total current will exceed the limit, thereby causing a power shut down. Isolate this problem by removing one of the devices, and use the computer under the same condition, and see whether a power shut down occurs. Do this procedure for all devices then determine the cause. Customer purchase of the larger AC adapter (50W, optional) is recommended, if it is not yet in use.

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TrackPoint Checkout

- If the TrackPoint does not work, check the configuration. If the configuration of the TrackPoint is set to **Disabled** or **Off**, change it to **Enable** or **On**.

  If the problem remains, continue.

  Note: TrackPoint automatically compensates to adjust the pointer sensor. This causes the pointer to move slightly on the screen and then stop. Pointer movement might occur when a slight, steady pressure is applied to the TrackPoint pointer when the computer is powered-on or running, or when exceeded temperature range requires re-adjustment.

- If the cursor floats or moves erratically, power-off and disconnect the mouse. Power-on the computer. If the problem goes away, replace the mouse. If the problem remains, replace the keyboard.
- For click button or pointing stick problems:
  1. Go to the Easy-Setup screen.
  2. Select an item with the pointing stick.
  3. Press either left or right click button.
  4. Verify that both buttons work correctly.

  If the pointing stick or the click button does not work, do the following.
  1. Reseat the keyboard cables.
  2. Replace the keyboard.
  3. Replace the interposer card (355x, 360x, 750x, 755x).
  4. Replace keyboard control card (720).
  5. Replace the system board.

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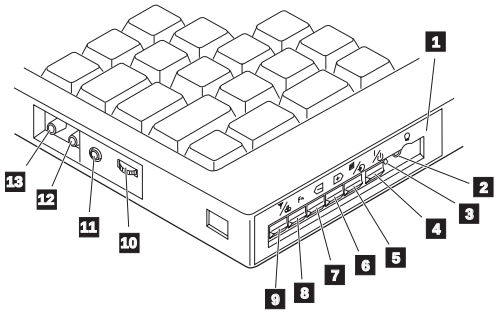
TV Tuner

The TV Tuner Pack (hereafter called TV Tuner) is an option for watching TV programs or videos on the IBM TFT color notebook computer. The computer changes to TV reception when the removable diskette drive is replaced with the TV Tuner.

The TV screen and normal computer display are easily switched by using the Hot key on the front panel of the TV Tuner.

Identifying Names and Functions

The following figure and table show the names and functions of each part of the TV Tuner.



Icons	Functions
1 Front Panel	Used to change the TV channels, switch TV mode to computer mode, and operate most functions of the TV Tuner.
2 Headphone Jack	Connects the headphones.
3 Power Indicator	Shows the TV Tuner is powered on.
4 Power Switch	Powered on and off the TV Tuner.
5 Hot Key	Switches between the TV screen and computer screen.
6 Up Switch	Increases the value such as the channel number.
7 Down Switch	Decreases the value such as the channel number.

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Icons	Functions
8 Function Key Fn	Enters the mode to change the value of each function, such as TV channel or color contrast. (See “Using the Function Key” on page 691.)
9 TV/EXT Switch	Switches the TV mode or external video mode.
10 Volume Knob	Controls the speaker volume.
11 Audio-In Jack	Connects the audio-in connector of the AV cable.
12 Video-In Jack	Connects video-in connector of the AV cable.
13 RF Connector	Connects the active antenna unit or antenna cable.

Using the Front Panel

The following table shows how to operate all functions of the TV Tuner with the controls on the front panel.

Key	Function
Power	Turns on the TV Tuner. This key is used only when the computer is turned on.
Hot Key	Switches computer display and TV screen.
Up	Increases the value of parameters, Channel Number, Color, Tint, Brightness, Contrast, Auto Tuning Sensitivity, On-screen Message Selection.
Down	Decreases the value of parameters, Channel Number, Color, Tint, Brightness, Contrast, Auto Tuning Sensitivity, On-screen Message Selection.
Function Fn	Selects a function mode to adjust each function parameter. (See “Using the Function Key” on page 691.)
TV/Ext	Switches the displayed video source between the receiving TV broadcast program and external devices such as VCR, video camera recorder, laser disk, and so on.

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Using the Function Key: Each time you press the Function key (Fn), one of the following messages (called *On-Screen Message*) appears at the top left corner of the LCD.

The changed values are automatically saved when you return to the “TV Channel” On-Screen message. The values are not saved when you power-off the TV Tuner without returning to this message.

Message on LCD	Parameter
(xx)	TV Channel By using ⊖ and ⊕, you can select the channels from 2 to 69.
COL	Color Adjustment By pressing and holding ⊖ or ⊕, you can change the color.
TNT	TINT Adjustment By pressing and holding ⊖ or ⊕, you can change the tint.
BRT	Bright Adjustment By pressing and holding ⊖ or ⊕, you can change the brightness.
CNT	Contrast Adjustment By pressing and holding ⊖ or ⊕, you can change the contrast.
---	(No function) Reserved.
LO HI	Auto Tune Sensitivity Selection LO: Means the sensitivity of the TV is low. In this mode, the TV Tuner receives strong TV signals only. To set LO, press ⊖. HI: Means the sensitivity of the TV is high (factory default). In this mode, the TV Tuner receives weak and strong TV signals. To set HI, press ⊕.
D3S DON	Time On-Screen Message appears D3S: On-Screen Message appears for 3 seconds. To set D3S, press ⊖. DON: On-Screen Message always appears. To set DON press ⊕

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Power-on the TV Tuner: Use the ThinkPad Features program or PS2.EXE. to power-on the TV Tuner; then power-on the internal device in the diskette drive compartment. If power for the internal device is turned off when the TV Tuner is set up, nothing appears on the LCD display. Turn on power for the TV Tuner again.

- If you are using DOS, do one of the following:
  - Power-on the computer and type PS2 from the command prompt to start the ThinkPad Features program.

    Select **Set Power Features** from the ThinkPad Features menu; then put a check mark at **Internal Serial Port** (or **Diskette Drive Compartment**) under the **Power for devices**. If you need help, press **F1** to display the help menu.
  - Type PS2 MODEM ON (or PS2 DDC ON) from the command prompt; press the Enter key to set the power ON.
- If you are using OS/2 or Microsoft Windows, do the following:
  1. Power-on the computer and start the ThinkPad Features program.
  2. Select the **Power** icon; then move the pointer to **Internal Serial Port** (or **Diskette Drive Compartment**) under the **Power for devices** and click the button to check mark it.
  3. Press the **OK** button.

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Troubleshooting

The following table shows what to do to solve problems when the TV Tuner does not work correctly.

Problem	Probable Cause
The TV Tuner does not operate. (No picture or sound)	• Computer is not powered on. • Computer is in suspend mode. • Volume control of the TV Tuner or computer is not adjusted correctly. • The power for the TV Tuner is not supplied. (See “Power-on the TV Tuner” on page 692.) • The wall outlet from the outdoor antenna is not active. • The video or antenna cable is not connected correctly. • Antenna elements of the active antenna unit are not adjusted. • The batteries in the active antenna unit are not inserted correctly. • The batteries in the active antenna unit are depleted. • The TV Tuner is not set up correctly. • You cannot watch TV or videos on the external display. • LO is set for the auto tune sensitivity selection. (See page 691.)
No color.	• The program is not in color.
Snow and noise only.	• Switch the TV/EXT ( ) button.
Pictures are out of shape, or have double images.	For TV: • The channel is not tuned correctly. • Adjust the antenna. For VCR: • Change the tracking adjustment.
Dotted lines or stripes.	• Usually caused by interference from neon signs, hair dryers, and so on. Move the computer to avoid the interference.
Picture control are not saved.	• Do not power-off the TV Tuner when adjusting functions such as picture control, color, tint, brightness, or contrast.
Channel number is always displayed or is not displayed.	Select your favorite mode for the on-screen message. (See page 691.)

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Miscellaneous Information

Acronyms, Abbreviations and Terms

Term	Information
ACPA/A	Audio Capture and Playback Adapter
ADP	Automatic Data Processing
Alt	Alternate
ANSI	American National Standards Institute
ARTIC	A Real Time Interface Coprocessor
ASCII	American National Standard Code for Interface Interchange
AT	Advanced Technology (as in AT Bus)
AVC	Audio Video Connection
BIOS	Basic Input/Output System (Controls System Resources)
bps	Bits Per Second
BPS	Bytes Per Second
CCITT	The International Telephone and Telegraph Consultative Committee
CCS	Common Command Set
CCSB	Common Complete Status Block
CCSB	Configuration Control Sub Board
CD	Compact Disc
CDPD	Cellular Digital Packet Data
CD-ROM	CD Read Only Memory (stores data/audio)
CE	Customer Engineer or Service Representative
CRC	Cyclic Redundancy Check
CRT	Cathode Ray Tube
CSD	Corrective Service Diskette
CGA	Color Graphics Adapter (See EGA, VGA, XGA)
CRC	Cyclic Redundancy Check
CRT	Cathode Ray Tube
CSA	Canadian Standards Association
CSD	Corrective Service Diskette
DASD	Direct Access Storage Device (hard disk, diskette)
DMA	Direct Memory Access
DRAM	Dynamic Random Access Memory
DSTN	Double Super Twisted Nematic
ECA	Engineering Change Announcement
ECC	Error Correction Code
EGA	Enhanced Graphics Adapter
ESD	Electrostatic Discharge
ESDI	Enhanced Small Device Interface
EEPROM	Electrically Erasable Programmable Read Only Memory
EWS	Energy Work Station
FDD	Floppy Disk Drive
FRU	Field Replaceable Unit (replaceable part)
GPIB	General Purpose Interface Bus (IEEE 348)
GSA	General Services Administration
HDD	Hard Disk Drive
Ht	Height
IDE	Integrated Drive Electronics
IC	Integrated Circuit
IEEE	Institute of Electrical and Electronics Engineers
IEC	International Electrotechnical Commission
IML	Initial Machine Load

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Term	Information
IPL	Initial Program Load
IR	Infrared
ISO	International Organization for Standardization
ISDN	Integrated-Services Digital Network
LAN	Local Area Network
LBA	Local Block Address
LTB	Local Transfer Bus
LUN	Logical Unit Number (as in SCSI)
MAP	Maintenance Analysis Procedure
MCGA	Modified Color Graphics Adapter (320 x 200 x 256)
MCA	Micro Channel Architecture (bus structure)
MHz	Mega hertz (millions of cycles per second)
MIDI	Musical Instrument Digital Interface
MM	Multimedia
N/A	Not Available or Not Applicable
NMI	Non-Maskable Interrupt
NSC	National Support Center
NVRAM	Non Volatile Random Access Memory
OEM	Original Equipment Manufacturer
PCMCIA	Personal Computer Memory Card International Association
POS	Programmable Option Select
PUN	Physical Unit Number (as in SCSI)
RAID	Redundant Array of Inexpensive Disks (disk array models)
RAM	Random Access Memory (read/write)
RGB	Red Green Blue (is in monitors)
RIPL	Remote Initial Program Load
ROM	Read Only Memory
SASD	Sequential Access Storage Device (Tape)
SCB	Subsystem Control Block
SCSI	Small Computer Systems Interface
SCSI ID	SCSI Identification Number (assigned device number)
SPD	Software Product Description
SR	Service Representative
SRAM	Static Random Access Memory
SVGA	Super Video Graphics Array
STN	Super Twisted Nematic
T/A	NDD Technical Advisor (See your Marketing Representative)
TDD	Telecommunications Device for the Deaf
TFT	Thin-Film Transistor
TPF	ThinkPad File
UL	Underwriters Laboratory
VCA	Video Capture Adapter
VESA	Video Electronics Standards Association
VGA	Video Graphics Array (640x480x16)
VPD	Vital Product Data
VRAM	Video Random Access Memory
WORM	Write Once, Read Many Media
XGA	Extended Graphics Array (1024 x 768 x 256)
Y/C	Luminance/Chrominance Signal (Pertains to Video)

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- Basic input/output system (BIOS)
- Options and adapters

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Problem Determination Tips

Due to the variety of hardware and software combinations that can be encountered, use the following information to assist you in problem determination. If possible, have this information available when requesting assistance from Service Support and Engineering functions.

- Machine type and model
- Processor or hard disk upgrades
- Failure symptom
  - Do diagnostics fail?
  - What, when, where, single, or multiple systems?
  - Is the failure repeatable?
  - Has this configuration ever worked?
  - If it has been working, what changes were made prior to it failing?
  - Is this the original reported failure?
- Reference Diskette Version
  - Type and revision level
- Hardware configuration
  - Print out (print screen) configuration from Reference Diskette currently in use
  - BIOS level
- Operating system software
  - Type and revision level

Important

To eliminate confusion, identical systems are considered *identical* only if they:

1. Are the exact machine type and models
2. Have the same BIOS level
3. Have the same adapters/attachments in the same locations
4. Have the same address jumpers/terminators/cabling
5. Have the same software versions and levels
6. Have the same Reference Diskette (version)
7. Have the same configuration options set in the system
8. Have the same setup for the operation system control files

Comparing the configuration and software set-up between “working and non-working” systems will often lead to problem resolution.

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800-426-2472	IBM Customer Engineer Technical Support
800-IBM-DEAL	IBM Dealer Support Center
800-342-6672	IBM Direct Desktop Software Sales
303-924-4015	IBM Part Number ID and Look Up
800-426-7763	IBM PC HelpCenter
800-237-5511	IBM Software Defect Support (CSDs)
800-327-5711	IBM Software Ordering (Publications)
800-426-1484	IBM Supplies Technical Hotline
800-388-7080	IBM Warranty Parts Claims Center

U.S. Customers and Helpware Subscribers

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800-426-8322	Customer Education Business Unit
800-999-0052	Customized Operational Services
800-237-4824	EduQuest (Educational Computers)
800-964-8523	End User HelpDesk Support
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800-447-4700	IBM Authorized Dealer Referrals
800-426-2468	IBM Dealer Referral
800-426-3333	IBM Information Referral Service
800-IBM-SERV	IBM Service
800-772-2227	IBM PC HelpCenter and HelpDesk
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800-241-1620	Multimedia HelpCenter
800-342-6672	OS/2 Information Line
800-237-5511	OS/2 Support Services
800-284-5933	Prodigy
914-962-0310	Prodigy User Questions
800-547-1283	Technical Coordinator Program SystemXtra for Personal Systems LAN Automated Distribution/2 OS/2 Bulletin Board OS/2 Application Assistance Center
800-551-2832	Technical Solutions Magazine

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514-938-6048	Business Partner Marketing Support - French
800-465-4YOU	Customer Relations
800-IBM-SERV	Customer Service Dispatch
800-263-2769	Customer Service Parts
800-465-2222	Customer Support Center (ISC)
416-443-5701	Customer Service Repair Centre
800-505-1855	Dealer Support Group (DSG)
800-465-7999	HelpClub Registration / IBM Direct
800-465-3299	HelpFax
905-316-3299	HelpFax - Toronto
800-565-3344	HelpPC
905-513-3355	IBM Certification Administrator Mail to: 50 Acadia Drive Markham, Ontario L3R 0B3
800-661-2131	IBM Education (A+ Course)
800-268-3100	IBM Information Network Support
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800-487-7426	International Warranty Registration
800-663-7662	Lexmark Product Information
800-IBM-9990	PartnerLine
800-263-2769	Parts Orders, Exchange or Emergency
416-443-5808 (Fax)	Parts Regular Orders, Exchange
416-443-5755	Parts Orders, Inquiries
514-938-3022	PC Co Bulletin Board - Montreal
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604-664-6464	PC Co Bulletin Board - Vancouver
204-934-2735	PC Co Bulletin Board - Winnepeg
800-661-7768	PS Marketing Support (PSMT)
800-565-3344	PS/1 Warranty Customer Helpline
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800-465-1234	Publications Ordering
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905-316-4150	Service (Warranty) Manager
905-316-4100 (Fax)	Service (Warranty) Manager
905-316-4872	Service Quality Programs
905-316-4100 (Fax)	Service Quality Programs
800-661-2131	Skill Dynamics (Education)
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905-316-2445	Warranty Claim Reimbursement
905-316-3515 (Fax)	Warranty Claim Reimbursement
416-443-5778	Warranty Claim Parts Inquiry
800-505-1855	Warranty Provider Support Hotline
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